

# ***OPTICAL GLASS***

## ***Catalogue***

POTAPENKO GLASS & FILTERS

EXPORT DIVISION

Version 3, 2010

[www.opticalglass.com.ua](http://www.opticalglass.com.ua)

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| 21.                      | 524 424 | K515    | 51.               | 601 477 | TFK11 | 81.            | 651 328 | OF8  | 111. | 812 295   | TBF25  |
| 22.                      | 525 580 | BKC (U) | 52.               | 603 301 | F6    | 82.            | 656 393 | TK21 | 112. | 814 270   | TBF10  |
| 23.                      | 526 438 | K20     | 53.               | 603 440 | TK13  | 83.            | 659 424 | CTK3 | 113. | 832 335   | TBF11  |
| 24.                      | 529 381 | OF1     | 54.               | 606 343 | BF27  | 84.            | 662 315 | OF5  | 114. | 858 290   | TBF8   |
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| 26.                      | 533 415 | K15     | 56.               | 611 418 | TK4   | 86.            | 671 366 | BF16 | 116. | 944 177   | CTF2   |
| 27.                      | 539 437 | BK6     | 57.               | 612 294 | F1    | 87.            | 672 263 | TF2  | 117. | 945 192   | TBF512 |
| 28.                      | 540 345 | LF12    | 58.               | 612 329 | OF3   | 88.            | 687 405 | CTK7 | 118. | 953 211   | TBF14  |
| 29.                      | 546 448 | BK8     | 59.               | 612432  | TK16  | 89.            | 689 255 | TF8  | 119. | 1 056 148 | CTF11  |
| 30.                      | 548 351 | LF10    | 60.               | 613 279 | F9    | 90.            | 691 238 | TF14 | 120. | 1 170 151 | CTF3   |
| <b>PG&amp;F, TM (UA)</b> |         |         | <b>GOST 13659</b> |         |       | <b>Article</b> |         |      |      |           |        |

| DATA SHEET  | FORMULAS   | GLASS CODE (d)  |
|---|--|---|
| <p>1. Refractive Index</p> $n = n_o + A / (\lambda - \lambda_o) B$ <p>A, B, <math>\lambda_o</math>, <math>n_o</math> are emperial constants</p> <p>2. Abbe Number</p> $V_d = (1 - n_d) / (n_F - n_C)$ <p>3. Partial Dispertion</p> <p><math>n_F - n_C</math> and <math>n_F - n_C</math> and other</p> <p>4. Realative Partial Dispersions</p> $P_e(x,y) = (n_x - n_y) / (n_F - n_C)$ <p>5. Deviation of Realative Partial Dispersions</p> $\Delta P_e(x,y) = P_e(x,y) - a_{x,y} - b_{x,y} V_e$ <p>6. Internal Transmittance</p> $T_x = T_o^{d/d_o}$ <p><math>T_o</math> refers, to the intrnal transmittance given for thickness <math>d_o</math> equal to either 10 mm or 25 mm.</p> | <p>7. Temperature Coefficient of Refractive Index</p> $NT_{abs} = NT_{realitive} + n NT_{air}$ <p>8. Transformation Temperature</p> $T_g = C' \text{ annealing point at aviscosity } 10^{13} \text{ dPas \{poise\}}$ <p>9. Exspansion Coefficient</p> $\alpha = L / \Delta L \Delta t, (10^{-7} C')$ <p>10. Density (Special Gravity)</p> $d \sim (n^2 - 1) / (n^2 + 2)$ <p>11. Grindability</p> <p>HG = grinability class (ISO/FDIS 12844)</p> <p>12. Knoop Hardness</p> <p>KH = knoop hardness (ISO 9385)</p> <p>13. Water Resistance</p> <p>WRs = surface method (GOST 13917)</p> | <p>14. Acide Resistance</p> <p>AR* = surface method (GOST 13917)</p> <p>13. Photoelastic Coefficient</p> $K = \Delta n / d / \Delta \sigma, (nm/cm 10^{-5} Pa)$ <p>Note: <math>1 \times 10^{-12} Pa = 0,9807 (nm/cm) / (kgf/cm^2)</math><br/> <math>10^5 Pa = 1,0197 kgf/cm^2 = 1 bar</math><br/> <math>1 \times 10^{-12} Pa = 1,0000197 nm/cm 10^{-5} Pa</math></p> <p>16. Farbcode</p> <p>FC = <math>\lambda</math> 80% and <math>\lambda</math> 5%</p> <p>17. Bubble</p> <p>B = bubble class (ISO 10110, part 3)</p> |
| PG&F, TM (UA)   | GOST 13659   | Article   |

| DATA SHEET                                    |          |         | LK1  |          |       | 439 688                             |         |          |
|---|----------|---------|--|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                              | nd       | 1,43986 | Abbe Number  | Vd       | 68,84 | Dispersion                          | nF-nC   | 0,006390 |
|   | ne       | 1,44138 |  | Ve       | 68,57 |                                     | nF'-nC' | 0,006430 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,45534 | nF-nC  | 0,006390 |       | Pe (i,h)                            | 0,7460  |          |
| nh  | 404,66   | 1,45054 | nF'-nC'  | 0,006430 |       | Pe (h,g)                            | 0,4405  |          |
| ng  | 435,83   | 1,44770 | <u>Deviation of Relative Partial Dispersions</u>       |          |       | Pe (g,F')                           | 0,4745  |          |
| nF'   | 479,99   | 1,44465 | delta Pe (i,F')  | 0,0420   |       | Pe (F',e)                           | 0,5077  |          |
| n488,0  | 488,00   | 1,44418 | delta Pe (g,F')  | 0,0060   |       | Pe (e,d)                            | 0,2368  |          |
| ne  | 546,07   | 1,44138 | delta Pe (F',e)  | 0,0039   |       | Pe (d,C')                           | 0,2566  |          |
| nd  | 587,56   | 1,43986 | delta Pe (F',r)  | -0,0061  |       | Pe (e,C')                           | 0,4923  |          |
| n632,8  | 632,80   | 1,43851 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                            | 0,2230  |          |
| nC'   | 643,85   | 1,43821 | Water Resistance                                       | WRs      | A     | Pe (r,s)                            | 0,3710  |          |
| n694,3  | 694,30   | 1,43704 | Acide Resistance                                       | AR*      | 4     | Pe (s,t)                            | 0,2900  |          |
| nr  | 706,52   | 1,43678 | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,43439 | Density, g\c.cm.                                       | SG       | 2,33  | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,43252 | Grindability   | HG       | HG3   | T 365                               | 0,765   |          |
| n1060,0                                       | 1 060,00 | 1,43206 | Knoop Hardness   | KH       | -     | T 400                               | 0,986   |          |
| <u>Termal Properties</u>                      |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 3,00  | T 440                               | 0,987   |          |
| Transformation<br>Temperature, C              | Tg       | 410     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550                               | -       |          |
| Expansion<br>Coefficient, 10 <sup>-7</sup> /C | Alpha    | 113     | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | -53   | T 640                               | 0,992   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | -36   | Ta                                  | 0,996   |          |
|   |          |         |  |          |       | <u>Other Properties</u>             |         |          |
|   |          |         |  |          |       | Bubble                              | B       | 4        |
|   |          |         |  |          |       | Farbcode                            | FC      | 37\30    |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>1</b>   |          |       | <b>4 492 001 000</b>                |         |          |

| DATA SHEET                                    |          |           | LK3  |          |       | 487 700                             |         |          |
|---|----------|-----------|--|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                              | nd       | 1,48746   | Abbe Number  | Vd       | 48,61 | Dispersion                          | nF-nC   | 0,006960 |
|   | ne       | 1,48912   |  | Ve       | 69,85 |                                     | nF'-nC' | 0,007002 |
| <u>Refractive Indices</u>                     |          |           | <u>Partial Dispersions</u>                             |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,50414   | nF-nC  | 0,006960 |       | Pe (i,h)                            | 0,7340  |          |
| nh  | 404,66   | 1,49900   | nF'-nC'  | 0,007002 |       | Pe (h,g)                            | 0,4338  |          |
| ng  | 435,83   | 1,49596   | <u>Deviation of Relative Partial Dispersions</u>       |          |       | Pe (g,F')                           | 0,4723  |          |
| nF'   | 479,99   | 1,49265   | delta Pe (i,F')  | 0,0340   |       | Pe (F',e)                           | 0,5052  |          |
| n488,0  | 488,00   | 1,49216   | delta Pe (g,F')  | 0,0058   |       | Pe (e,d)                            | 0,2362  |          |
| ne  | 546,07   | 1,48912   | delta Pe (F',e)  | 0,0022   |       | Pe (d,C')                           | 0,2585  |          |
| nd  | 587,56   | 1,48746   | delta Pe (F',r)  | -0,0019  |       | Pe (e,C')                           | 0,4947  |          |
| n632,8  | 632,80   | 1,48598   | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                            | 0,2280  |          |
| nC'   | 643,85   | 1,48565   | Water Resistance                                       | WRs      | A     | Pe (r,s)                            | 0,3910  |          |
| n694,3  | 694,30   | 1,48434   | Acide Resistance                                       | AR*      | 4     | Pe (s,t)                            | 0,3180  |          |
| nr  | 706,52   | 1,48406   | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,48132   | Density, g/c.cm.                                       | SG       | 2,46  | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,47909   | Grindability   | HG       | HG3   | T 365                               | 0,972   |          |
| n1060,0                                       | 1 060,00 | 1,47852   | Knoop Hardness   | KH       | -     | T 400                               | 0,996   |          |
| <u>Termal Properties</u>                      |          |           | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 2,90  | T 440                               | 0,993   |          |
| Transformation<br>Temperature, C              | Tg       | 485<br>92 | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550                               | 0,995   |          |
| Expansion Coefficient,<br>10 <sup>-6</sup> /C | Alpha    |           | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | -30   | T 640                               | 0,993   |          |
|   |          |           | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | -17   | Ta                                  | 0,995   |          |
|   |          |           |  |          |       | <u>Other Properties</u>             |         |          |
|   |          |           |  |          |       | Bubble                              | B       | 4        |
|   |          |           |  |          |       | Farbcode                            | FC      | 35\31    |
| <b>PG&amp;F, TM (UA)</b>                      |          |           | <b>6</b>   |          |       | <b>4 492 002 000</b>                |         |          |

| DATA SHEET   |          |         | LK4   |          |          | 490 651                             |         |          |       |
|--|----------|---------|---|----------|----------|-------------------------------------|---------|----------|-------|
| Refractive Index                                   | nd       | 1,49037 | Abbe Number   | Vd       | 45,32    | Dispersion                          | nF-nC   | 0,007530 |       |
|  | ne       | 1,49217 |   | Ve       | 64,96    |                                     | nF'-nC' | 0,007577 |       |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |          | <u>Relative Partial Dispersions</u> |         |          |       |
| ni   | 365,00   | 1,50847 | nF-nC   | 0,007530 |          | Pe (i,h)                            | 0,7390  |          |       |
| nh   | 404,66   | 1,50287 | nF'-nC'   | 0,007577 |          | Pe (h,g)                            | 0,4351  |          |       |
| ng   | 435,83   | 1,49957 | <u>Deviation of Relative Partial Dispersions</u>    |          |          | Pe (g,F')                           | 0,4720  |          |       |
| nF'  | 479,99   | 1,49600 | delta Pe (i,F')                                     | -0,0060  |          | Pe (F',e)                           | 0,5049  |          |       |
| n488,0   | 488,00   | 1,49545 | delta Pe (g,F')                                     | -0,0021  |          | Pe (e,d)                            | 0,2378  |          |       |
| ne   | 546,07   | 1,49217 | delta Pe (F',e)                                     | -0,0009  |          | Pe (d,C')                           | 0,2573  |          |       |
| nd   | 587,56   | 1,49037 | delta Pe (F',r)                                     | 0,0009   |          | Pe (e,C')                           | 0,4950  |          |       |
| n632,8   | 632,80   | 1,48877 | <u>Chemical Properties</u>                          |          |          | Pe (C,r)                            | 0,2270  |          |       |
| nC'  | 643,85   | 1,48842 | Water Resistance                                    | WRs      | A        | Pe (r,s)                            | 0,3880  |          |       |
| n694,3   | 694,30   | 1,48700 | Acide Resistance                                    | AR*      | 3        | Pe (s,t)                            | 0,3180  |          |       |
| nr   | 706,52   | 1,48670 | <u>Internal Transmittance</u>                       |          |          | 10 mm                               |         |          |       |
| ns   | 852,10   | 1,48376 | T 365   |          |          | 0,975                               |         |          |       |
| nt   | 1 013,90 | 1,48135 | T 400   |          |          | 0,992                               |         |          |       |
| n1060,0  | 1 060,00 | 1,48075 | T 440   |          |          | 0,988                               |         |          |       |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |          | T 550                               |         |          |       |
| Transformation Temperature, C                      | Tg       | 560     | Density, glc.cm.                                    | SG       | 2,33     | T 640                               |         |          |       |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 52      | Grindability  | HG       | HG3      | 0,995                               |         |          |       |
|  |          |         | Knoop Hardness                                      | KH       | -        | Ta                                  |         |          |       |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 3,70     | 0,997                               |         |          |       |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |          | Bubble                              |         |          |       |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          | NTabs   | 19  |          | Farbcode |                                     |         | B        | 4     |
| Range of Temperature, C: 20 ... 120, C'-Line       |          | NTabs   | 36  |          | FC       |                                     |         | FC       | 35\31 |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>7</b>  |          |          | <b>4 492 004 000</b>                |         |          |       |

| DATA SHEET                                 |          |         | LK5   |          |        | 478 655                             |         |          |
|--|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                           | nd       | 1,47817 | Abbe Number   | Vd       | 45,23  | Dispersion                          | nF-nC   | 0,007290 |
|  | ne       | 1,47990 |   | Ve       | 65,44  |                                     | nF'-nC' | 0,007334 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,49561 | nF-nC   | 0,007290 |        | Pe (i,h)                            | 0,7320  |          |
| nh   | 404,66   | 1,49024 | nF'-nC'   | 0,007334 |        | Pe (h,g)                            | 0,4329  |          |
| ng   | 435,83   | 1,48706 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,4723  |          |
| nF'  | 479,99   | 1,48360 | delta Pe (i,F')                                     | -0,0100  |        | Pe (F',e)                           | 0,5044  |          |
| n488,0                                     | 488,00   | 1,48307 | delta Pe (g,F')                                     | -0,0010  |        | Pe (e,d)                            | 0,2367  |          |
| ne   | 546,07   | 1,47990 | delta Pe (F',e)                                     | -0,0012  |        | Pe (d,C')                           | 0,2589  |          |
| nd   | 587,56   | 1,47817 | delta Pe (F',r)                                     | 0,0022   |        | Pe (e,C')                           | 0,4956  |          |
| n632,8                                     | 632,80   | 1,47660 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,2290  |          |
| nC'  | 643,85   | 1,47627 | Water Resistance                                    | WRs      | A      | Pe (r,s)                            | 0,3930  |          |
| n694,3                                     | 694,30   | 1,47489 | Acide Resistance                                    | AR*      | 4      | Pe (s,t)                            | 0,3240  |          |
| nr   | 706,52   | 1,47459 | <u>Mechanical Properties</u>                        |          |        | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,47171 | Density, g/cm <sup>3</sup>                          | SG       | 2,27   | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,46933 | Grindability  | HG       | HG5    | T 365                               | 0,878   |          |
| n1060,0                                    | 1 060,00 | 1,46873 | Knoop Hardness                                      | KH       | 521,00 | T 400                               | 0,973   |          |
| <u>Thermal Properties</u>                  |          |         | Photoelastic Coefficient, nm/cm 10 <sup>-5</sup> Pa | K        | 3,55   | T 440                               | 0,975   |          |
| Transformation Temperature, C              | Tg       | 625     | <u>Temperature Coefficient of Refractive Index</u>  |          |        | T 550                               | 0,993   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 35      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | 46     | T 640                               | 0,990   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 62     | Ta                                  | 0,993   |          |
|  |          |         |   |          |        | <u>Other Properties</u>             |         |          |
|  |          |         |   |          |        | Bubble                              | B       | 4        |
|  |          |         |   |          |        | Farbcode                            | FC      | 35\33    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>4</b>  |          |        | <b>4 492 005 000</b>                |         |          |

| DATA SHEET   |          |         | LK6   |          |        | 470 668                             |         |          |
|--|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,47046 | Abbe Number   | Vd       | 46,53  | Dispersion                          | nF-nC   | 0,007040 |
|  | ne       | 1,47214 |   | Ve       | 66,64  |                                     | nF'-nC' | 0,007085 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,48736 | nF-nC   | 0,007040 |        | Pe (i,h)                            | 0,7350  |          |
| nh   | 404,66   | 1,48215 | nF'-nC'   | 0,007085 |        | Pe (h,g)                            | 0,4345  |          |
| ng   | 435,83   | 1,47907 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,4726  |          |
| nF'  | 479,99   | 1,47572 | delta Pe (i,F')                                     | 0,0060   |        | Pe (F',e)                           | 0,5054  |          |
| n488,0   | 488,00   | 1,47521 | delta Pe (g,F')                                     | 0,0012   |        | Pe (e,d)                            | 0,2366  |          |
| ne   | 546,07   | 1,47214 | delta Pe (F',e)                                     | 0,0004   |        | Pe (d,C')                           | 0,2580  |          |
| nd   | 587,56   | 1,47046 | delta Pe (F',r)                                     | -0,0005  |        | Pe (e,C')                           | 0,4947  |          |
| n632,8   | 632,80   | 1,46897 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,2270  |          |
| nC'  | 643,85   | 1,46864 | Water Resistance                                    | WRs      | A      | Pe (r,s)                            | 0,3880  |          |
| n694,3   | 694,30   | 1,46732 | Acide Resistance                                    | AR*      | 6      | Pe (s,t)                            | 0,3180  |          |
| nr   | 706,52   | 1,46703 | <u>Internal Transmittance</u>                       |          |        | 10 mm                               |         |          |
| ns   | 852,10   | 1,46428 |   |          |        | T 365                               | 0,952   |          |
| nt   | 1 013,90 | 1,46203 |   |          |        | T 400                               | 0,987   |          |
| n1060,0  | 1 060,00 | 1,46146 |   |          |        | T 440                               | 0,983   |          |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |        | T 550                               | 0,995   |          |
| Transformation Temperature, C                      | Tg       | 410     | Density, g/c.cm.                                    | SG       | 2,30   | T 640                               | 0,992   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 82      | Grindability  | HG       | HG3    | Ta                                  | 0,995   |          |
|  |          |         | Knoop Hardness                                      | KH       | 372,00 |                                     |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 3,80   |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |        |                                     |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | -24      |        | Bubble                              | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | -10      |        | Farbcode                            | FC      | 35\32    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>2</b>  |          |        | <b>4 492 007 000</b>                |         |          |



| DATA SHEET                                    |          |         | LK7  |          |        | 482 663                              |         |          |
|---|----------|---------|--|----------|--------|--------------------------------------|---------|----------|
| Refractive Index                              | nd       | 1,48287 | Abbe Number  | Vd       | 46,00  | Dispersion                           | nF-nC   | 0,007280 |
|   | ne       | 1,48461 |  | Ve       | 66,17  |                                      | nF'-nC' | 0,007324 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |        | <u>Realative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,50025 | nF-nC  | 0,007280 |        | Pe (i,h)                             | 0,7300  |          |
| nh  | 404,66   | 1,49490 | nF'-nC'  | 0,007324 |        | Pe (h,g)                             | 0,4317  |          |
| ng  | 435,83   | 1,49174 | <u>Deviation of Realative Partial Dispersions</u>      |          |        | Pe (g,F')                            | 0,4697  |          |
| nF'   | 479,99   | 1,48830 | delta Pe (i,F')  | -0,0090  |        | Pe (F',e)                            | 0,5039  |          |
| n488,0  | 488,00   | 1,48777 | delta Pe (g,F')  | -0,0025  |        | Pe (e,d)                             | 0,2379  |          |
| ne  | 546,07   | 1,48461 | delta Pe (F',e)  | -0,0012  |        | Pe (d,C')                            | 0,2582  |          |
| nd  | 587,56   | 1,48287 | delta Pe (F',r)  | 0,0004   |        | Pe (e,C')                            | 0,4961  |          |
| n632,8  | 632,80   | 1,48131 | <u>Chemical Properties</u>                             |          |        | Pe (C,r)                             | 0,2270  |          |
| nC'   | 643,85   | 1,48098 | Water Resistance                                       | WRs      | A      | Pe (r,s)                             | 0,3900  |          |
| n694,3  | 694,30   | 1,47960 | Acide Resistance                                       | AR*      | 1      | Pe (s,t)                             | 0,3200  |          |
| nr  | 706,52   | 1,47931 | <u>Mechanical Properties</u>                           |          |        | <u>Internal Transmittance</u>        |         |          |
| ns  | 852,10   | 1,47645 | Density, g/c.cm.                                       | SG       | 2,30   | 10 mm                                |         |          |
| nt  | 1 013,90 | 1,47411 | Grindability   | HG       | HG5    | T 365                                | 0,938   |          |
| n1060,0                                       | 1 060,00 | 1,47352 | Knoop Hardness   | KH       | 443,00 | T 400                                | 0,986   |          |
| <u>Termal Properties</u>                      |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 3,55   | T 440                                | 0,975   |          |
| Transformation<br>Temperature, C              | Tg       | 610     | <u>Temperature Coefficient of Refractive Index</u>     |          |        | T 550                                | 0,991   |          |
| Expansion Coefficient,<br>10 <sup>-7</sup> /C | Alpha    | 44      | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | 34     | T 640                                | 0,989   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 50     | Ta                                   | 0,991   |          |
|   |          |         |  |          |        | <u>Other Properties</u>              |         |          |
|   |          |         |  |          |        | Bubble                               | B       | 4        |
|   |          |         |  |          |        | Farbcode                             | FC      | 35\32    |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>5</b>   |          |        | <b>4 492 009 000</b>                 |         |          |

| DATA SHEET                                      |          |         | LK8  |          |       | 470 685                             |         |          |
|---|----------|---------|--|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                | nd       | 1,47086 | Abbe Number  | Vd       | 47,86 | Dispersion                          | nF-nC   | 0,006870 |
|   | ne       | 1,47249 |  | Ve       | 68,36 |                                     | nF'-nC' | 0,006912 |
| <u>Refractive Indices</u>                       |          |         | <u>Partial Dispersions</u>                               |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,48721 | nF-nC  | 0,006870 |       | Pe (i,h)                            | 0,7260  |          |
| nh  | 404,66   | 1,48219 | nF'-nC'  | 0,006912 |       | Pe (h,g)                            | 0,4301  |          |
| ng  | 435,83   | 1,47922 | <u>Deviation of Relative Partial Dispersions</u>         |          |       | Pe (g,F')                           | 0,4680  |          |
| nF'   | 479,99   | 1,47598 | delta Pe (i,F')  | -        |       | Pe (F',e)                           | 0,5054  |          |
| n488,0  | 488,00   | 1,47548 | delta Pe (g,F')  | -0,0010  |       | Pe (e,d)                            | 0,2352  |          |
| ne  | 546,07   | 1,47249 | delta Pe (F',e)  | 0,0014   |       | Pe (d,C')                           | 0,2595  |          |
| nd  | 587,56   | 1,47086 | delta Pe (F',r)  | -0,0030  |       | Pe (e,C')                           | 0,4948  |          |
| n632,8  | 632,80   | 1,46939 | <u>Chemical Properties</u>                               |          |       | Pe (C,r)                            | 0,2260  |          |
| nC'   | 643,85   | 1,46907 | Water Resistance   | WRs      | A     | Pe (r,s)                            | 0,3860  |          |
| n694,3  | 694,30   | 1,46779 | Acide Resistance   | AR*      | 2     | Pe (s,t)                            | 0,3170  |          |
| nr  | 706,52   | 1,46751 | <u>Mechanical Properties</u>                             |          |       | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,46484 | Density, g/c.cm.   | SG       | 2,32  | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,46265 | Grindability   | HG       | HG4   | T 365                               | 0,996   |          |
| n1060,0   | 1 060,00 | 1,46211 | Knoop Hardness   | KH       | -     | T 400                               | 0,996   |          |
| <u>Termal Properties</u>                        |          |         | Photoelastic Coefficient,<br>nm/cm 10 <sup>^</sup> -5 Pa | K        | 3,40  | T 440                               | 0,995   |          |
| Transformation<br>Temperature, C                | Tg       | 500     | <u>Temperature Coefficient of Refractive Index</u>       |          |       | T 550                               | 0,996   |          |
| Exspansion<br>Coefficient, 10 <sup>^</sup> -7/C | Alpha    | 56      | Range of Temperature, C: - 60 ... 20, C'-Line            | NTabs    | 11    | T 640                               | 0,993   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line             | NTabs    | 31    | Ta                                  | 0,996   |          |
|   |          |         |  |          |       | <u>Other Properties</u>             |         |          |
|   |          |         |  |          |       | Bubble                              | B       | 4        |
|   |          |         |  |          |       | Farbcode                            | FC      | 33\29    |
| <b>PG&amp;F, TM (UA)</b>                        |          |         | <b>3</b>   |          |       | <b>4 492 011 000</b>                |         |          |

| DATA SHEET   |          |           | K1  |          |           | 498 651                             |         |          |  |
|--|----------|-----------|---|----------|-----------|-------------------------------------|---------|----------|--|
| Refractive Index                                   | nd       | 1,49827   | Abbe Number   | Vd       | 45,4      | Dispersion                          | nF-nC   | 0,007650 |  |
|  | ne       | 1,50009   |   | Ve       | 65,0      |                                     | nF'-nC' | 0,007698 |  |
| <u>Refractive Indices</u>                          |          |           | <u>Partial Dispersions</u>                          |          |           | <u>Relative Partial Dispersions</u> |         |          |  |
| ni   | 365,00   | 1,51667   | nF-nC   | 0,007650 | Pe (i,h)  | 0,7390                              |         |          |  |
| nh   | 404,66   | 1,51098   | nF'-nC'   | 0,007698 | Pe (h,g)  | 0,4357                              |         |          |  |
| ng   | 435,83   | 1,50763   | <u>Deviation of Realative Partial Dispersions</u>   |          |           | Pe (g,F')                           | 0,4729  |          |  |
| nF'  | 479,99   | 1,50399   | delta Pe (i,F')                                     | -0,0050  | Pe (F',e) | 0,5058                              |         |          |  |
| n488,0   | 488,00   | 1,50343   | delta Pe (g,F')                                     | -0,0011  | Pe (e,d)  | 0,2369                              |         |          |  |
| ne   | 546,07   | 1,50009   | delta Pe (F',e)                                     | -0,0001  | Pe (d,C') | 0,2573                              |         |          |  |
| nd   | 587,56   | 1,49827   | delta Pe (F',r)                                     | 0,0029   | Pe (e,C') | 0,4942                              |         |          |  |
| n632,8   | 632,80   | 1,49664   | <u>Chemical Properties</u>                          |          |           | Pe (C,r)                            | 0,2280  |          |  |
| nC'  | 643,85   | 1,49629   | Water Resistance                                    | WRs      | A         | Pe (r,s)                            | 0,3860  |          |  |
| n694,3   | 694,30   | 1,49485   | Acide Resistance                                    | AR*      | 5         | Pe (s,t)                            | 0,3170  |          |  |
| nr   | 706,52   | 1,49453   | <u>Internal Transmittance</u>                       |          |           | 10 mm                               |         |          |  |
| ns   | 852,10   | 1,49156   |   |          |           | T 365                               | 0,938   |          |  |
| nt   | 1 013,90 | 1,48912   |   |          |           | T 400                               | 0,994   |          |  |
| n1060,0  | 1 060,00 | 1,48851   |   |          |           | T 440                               | 0,990   |          |  |
| <u>Termal Properties</u>                           |          |           | <u>Mechanical Properties</u>                        |          |           | T 550                               | 0,997   |          |  |
| Transformation Temperature, C                      | Tg       | 615<br>65 | Density, g/c.cm.                                    | SG       | 2,36      | T 640                               | 0,996   |          |  |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    |           | Grindability  | HG       | HG3       | Ta                                  | 0,997   |          |  |
|  |          |           | Knoop Hardness                                      | KH       | -         |                                     |         |          |  |
|  |          |           | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 3,50      |                                     |         |          |  |
| <u>Temperature Coefficient of Refractive Index</u> |          |           | <u>Other Properties</u>                             |          |           |                                     |         |          |  |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |           | NTabs   | 1        |           | Bubble                              | B       | 3        |  |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |           | NTabs   | 14       |           | Farbcode                            | FC      | 35\32    |  |
| <b>PG&amp;F, TM (UA)</b>                           |          |           | <b>8</b>  |          |           | <b>4 492 051 000</b>                |         |          |  |

| DATA SHEET   |          |           | K2  |          |       | 500 660                              |         |          |
|--|----------|-----------|---|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,50047   | Abbe Number   | Vd       | 46,32 | Dispersion                           | nF-nC   | 0,007580 |
|  | ne       | 1,50228   |   | Ve       | 65,84 |                                      | nF'-nC' | 0,007629 |
| <u>Refractive Indices</u>                          |          |           | <u>Partial Dispersions</u>                          |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,51869   | nF-nC   | 0,007580 |       | Pe (i,h)                             | 0,7350  |          |
| nh   | 404,66   | 1,51308   | nF'-nC'   | 0,007629 |       | Pe (h,g)                             | 0,4364  |          |
| ng   | 435,83   | 1,50975   | <u>Deviation of Realative Partial Dispersions</u>   |          |       | Pe (g,F')                            | 0,4746  |          |
| nF'  | 479,99   | 1,50613   |   |          |       | delta Pe (i,F')                      | 0,0020  |          |
| n488,0   | 488,00   | 1,50558   | delta Pe (g,F')                                     | 0,0019   |       | Pe (e,d)                             | 0,2368  |          |
| ne   | 546,07   | 1,50228   | delta Pe (F',e)                                     | -0,0001  |       | Pe (d,C')                            | 0,2579  |          |
| nd   | 587,56   | 1,50047   | delta Pe (F',r)                                     | 0,0002   |       | Pe (e,C')                            | 0,4947  |          |
| n632,8   | 632,80   | 1,49885   | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                             | 0,2270  |          |
| nC'  | 643,85   | 1,49850   |   |          |       | Water Resistance                     | WRs     | A        |
| n694,3   | 694,30   | 1,49708   | Acide Resistance                                    | AR*      | 1     | <u>Internal Transmittance</u>        |         |          |
| nr   | 706,52   | 1,49677   |   |          |       | 10 mm                                |         |          |
| ns   | 852,10   | 1,49384   |   |          |       | T 365                                | 0,959   |          |
| nt   | 1 013,90 | 1,49147   | T 400   | 0,993    |       |                                      |         |          |
| n1060,0  | 1 060,00 | 1,49088   | T 440   | 0,988    |       |                                      |         |          |
| <u>Termal Properties</u>                           |          |           | <u>Mechanical Properties</u>                        |          |       | T 550                                | 0,995   |          |
| Transformation Temperature, C                      | Tg       | 545<br>64 | Density, g/c.cm.                                    | SG       | 2,38  | T 640                                | 0,994   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    |           | Grindability  | HG       | HG4   | Ta                                   | 0,995   |          |
|  |          |           | Knoop Hardness                                      | KH       | -     |                                      |         |          |
|  |          |           | Photoelastic Coefficient, nm/cm 10 <sup>-5</sup> Pa | K        | 3,25  |                                      |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |           |   |          |       | <u>Other Properties</u>              |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |           | NTabs   | 11       |       | Bubble                               | B       | 3        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |           | NTabs   | 23       |       | Farbcode                             | FC      | 34\31    |
| <b>PG&amp;F, TM (UA)</b>                           |          |           | <b>10</b>   |          |       | <b>4 492 052 000</b>                 |         |          |

| DATA SHEET   |          |         | K3  |          |       | 510 633                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,51007 | Abbe Number   | Vd       | 45,13 | Dispersion                          | nF-nC   | 0,008050 |
|  | ne       | 1,51990 |   | Ve       | 63,14 |                                     | nF'-nC' | 0,008109 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,52962 | nF-nC   | 0,008050 |       | Pe (i,h)                            | 0,7470  |          |
| nh   | 404,66   | 1,52356 | nF'-nC'   | 0,008109 |       | Pe (h,g)                            | 0,4410  |          |
| ng   | 435,83   | 1,51998 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,4782  |          |
| nF'  | 479,99   | 1,51611 | delta Pe (i,F')                                     | -0,0030  |       | Pe (F',e)                           | 0,5072  |          |
| n488,0   | 488,00   | 1,51552 | delta Pe (g,F')                                     | 0,0015   |       | Pe (e,d)                            | 0,2366  |          |
| ne   | 546,07   | 1,51990 | delta Pe (F',e)                                     | 0,0003   |       | Pe (d,C')                           | 0,2561  |          |
| nd   | 587,56   | 1,51007 | delta Pe (F',r)                                     | -0,0002  |       | Pe (e,C')                           | 0,4928  |          |
| n632,8   | 632,80   | 1,50837 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2240  |          |
| nC'  | 643,85   | 1,50800 | Water Resistance                                    | WRs      | B     | Pe (r,s)                            | 0,3760  |          |
| n694,3   | 694,30   | 1,50650 | Acide Resistance                                    | AR*      | 1     | Pe (s,t)                            | 0,3010  |          |
| nr   | 706,52   | 1,50618 |   |          |       | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,50313 |   |          |       | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,50069 |   |          |       | T 365                               | 0,919   |          |
| n1060,0  | 1 060,00 | 1,50009 |   |          |       | T 400                               | 0,978   |          |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |       | T 440                               | 0,983   |          |
| Transformation Temperature, C                      | Tg       | 550     | Density, g/c.cm.                                    | SG       | 2,47  | T 550                               | 0,995   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 83      | Grindability  | HG       | HG4   | T 640                               | 0,993   |          |
|  |          |         | Knoop Hardness                                      | KH       | -     | Ta                                  | 0,995   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,75  |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 0        |       | Bubble                              | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 14       |       | Farbcode                            | FC      | 34\32    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>11</b>   |          |       | <b>4 492 054 000</b>                |         |          |

| DATA SHEET   |          |           | K8  |          |        | 516 640                             |         |          |           |
|--|----------|-----------|---|----------|--------|-------------------------------------|---------|----------|-----------|
| Refractive Index                                   | nd       | 1,51637   | Abbe Number                                       | Vd       | 45,20  | Dispersion                          | nF-nC   | 0,008060 |           |
|  | ne       | 1,51829   |   | Ve       | 63,87  |                                     | nF'-nC' | 0,008115 |           |
| <u>Refractive Indices</u>                          |          |           | <u>Partial Dispersions</u>                        |          |        | <u>Relative Partial Dispersions</u> |         |          |           |
| ni   | 365,00   | 1,53582   | nF-nC   | 0,008060 |        | Pe (i,h)                            | 0,7390  |          |           |
| nh   | 404,66   | 1,52982   | nF'-nC'   | 0,008115 |        | Pe (h,g)                            | 0,4380  |          |           |
| ng   | 435,83   | 1,52627   | <u>Deviation of Realative Partial Dispersions</u> |          |        | Pe (g,F')                           | 0,4754  |          |           |
| nF'  | 479,99   | 1,52241   |   |          |        | delta Pe (i,F')                     | -0,0100 |          | Pe (F',e) |
| n488,0   | 488,00   | 1,52181   | delta Pe (g,F')                                   | -0,0003  |        | Pe (e,d)                            | 0,2367  |          |           |
| ne   | 546,07   | 1,51829   | delta Pe (F',e)                                   | 0,0004   |        | Pe (d,C')                           | 0,2564  |          |           |
| nd   | 587,56   | 1,51637   | delta Pe (F',r)                                   | 0,0004   |        | Pe (e,C')                           | 0,4931  |          |           |
| n632,8   | 632,80   | 1,51466   | <u>Chemical Properties</u>                        |          |        | Pe (C,r)                            | 0,2260  |          |           |
| nC'  | 643,85   | 1,51429   |   |          |        | Water Resistance                    | WRs     | A        | Pe (r,s)  |
| n694,3   | 694,30   | 1,51279   | Acide Resistance                                  | AR*      | 1      | <u>Internal Transmittance</u>       |         |          |           |
| nr   | 706,52   | 1,51246   | <u>Mechanical Properties</u>                      |          |        | 10 mm                               |         |          |           |
| ns   | 852,10   | 1,50937   |   |          |        | Density, g/c.cm.                    | SG      | 2,52     | T 365     |
| nt   | 1 013,90 | 1,50687   | Grindability                                      | HG       | HG4    | T 400                               | 0,992   |          |           |
| n1060,0  | 1 060,00 | 1,50625   | Knoop Hardness                                    | KH       | 498,00 | T 440                               | 0,990   |          |           |
| <u>Termal Properties</u>                           |          |           | Photoelastic Coefficient,                         | K        | 2,70   | T 550                               | 0,996   |          |           |
| Transformation Temperature, C                      | Tg       | 550<br>76 | nm\cm 10 <sup>-5</sup> Pa                         |          |        |                                     | T 640   | 0,992    |           |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    |           |   |          |        | Ta                                  | 0,996   |          |           |
| <u>Temperature Coefficient of Refractive Index</u> |          |           |   |          |        | <u>Other Properties</u>             |         |          |           |
| Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    | 3         |   |          |        | Bubble                              | B       | 3        |           |
| Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    | 18        |   |          |        | Farbcode                            | FC      | 34\32    |           |
| <b>PG&amp;F, TM (UA)</b>                           |          |           | <b>14</b>   |          |        | <b>4 492 056 000</b>                |         |          |           |

| DATA SHEET   |          |           | K14   |          |       | 514 606                             |         |          |
|--|----------|-----------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,51478   | Abbe Number   | Vd       | 43,64 | Dispersion                          | nF-nC   | 0,008490 |
|  | ne       | 1,51681   |   | Ve       | 60,40 |                                     | nF'-nC' | 0,008557 |
| <u>Refractive Indices</u>                          |          |           | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,53557   | nF-nC   | 0,008490 |       | Pe (i,h)                            | 0,7610  |          |
| nh   | 404,66   | 1,52906   | nF'-nC'   | 0,008557 |       | Pe (h,g)                            | 0,4442  |          |
| ng   | 435,83   | 1,52526   | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,4796  |          |
| nF'  | 479,99   | 1,52116   | delta Pe (i,F')                                     | -0,0100  |       | Pe (F',e)                           | 0,5081  |          |
| n488,0   | 488,00   | 1,52053   | delta Pe (g,F')                                     | -0,0012  |       | Pe (e,d)                            | 0,2375  |          |
| ne   | 546,07   | 1,51681   | delta Pe (F',e)                                     | -0,0003  |       | Pe (d,C')                           | 0,2544  |          |
| nd   | 587,56   | 1,51478   | delta Pe (F',r)                                     | -0,0010  |       | Pe (e,C')                           | 0,4919  |          |
| n632,8   | 632,80   | 1,51299   | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2220  |          |
| nC'  | 643,85   | 1,51260   | Water Resistance                                    | WRs      | A     | Pe (r,s)                            | 0,3700  |          |
| n694,3   | 694,30   | 1,51104   | Acide Resistance                                    | AR*      | 1     | Pe (s,t)                            | 0,2940  |          |
| nr   | 706,52   | 1,51070   | <u>Internal Transmittance</u>                       |          |       | 10 mm                               |         |          |
| ns   | 852,10   | 1,50753   |   |          |       | T 365                               | 0,994   |          |
| nt   | 1 013,90 | 1,50501   |   |          |       | T 400                               | 0,988   |          |
| n1060,0  | 1 060,00 | 1,50440   |   |          |       | T 440                               | 0,989   |          |
| <u>Thermal Properties</u>                          |          |           | <u>Mechanical Properties</u>                        |          |       | T 550                               | 0,995   |          |
| Transformation Temperature, C                      | Tg       | 545<br>71 | Density, g\c.cm.                                    | SG       | 2,53  | T 640                               | 0,993   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    |           | Grindability  | HG       | HG4   | Ta                                  | 0,995   |          |
|  |          |           | Knoop Hardness                                      | KH       | -     |                                     |         |          |
|  |          |           | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 3,20  |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |           | <u>Other Properties</u>                             |          |       |                                     |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |           | NTabs   | 18       |       | Bubble                              | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |           | NTabs   | 34       |       | Farbcode                            | FC      | 35\33    |
| <b>PG&amp;F, TM (UA)</b>                           |          |           | <b>12</b>   |          |       | <b>4 492 059 000</b>                |         |          |

| DATA SHEET   |          |         | K15  |          |       | 533 554                                       |         |          |
|--|----------|---------|--|----------|-------|---|---------|----------|
| Refractive Index                                   | nd       | 1,53359 | Abbe Number  | Vd       | 55,47 | Dispersion                                    | nF-nC   | 0,009620 |
|  | ne       | 1,53588 |  | Ve       | 55,18 |   | nF'-nC' | 0,009711 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Realative Partial Dispersions</u>          |         |          |
| ni   | 365,00   | 1,55756 | nF-nC  | 0,009620 |       | Pe (i,h)                                      | 0,7770  |          |
| nh   | 404,66   | 1,55001 | nF'-nC'  | 0,009711 |       | Pe (h,g)                                      | 0,4555  |          |
| ng   | 435,83   | 1,54559 | <u>Deviation of Relative Partial Dispersions</u>       |          |       | Pe (g,F')                                     | 0,4877  |          |
| nF'  | 479,99   | 1,54085 |  |          |       | delta Pe (i,F')                               | -0,0230 |          |
| n488,0   | 488,00   | 1,54013 | delta Pe (g,F')  | -0,0008  |       | Pe (e,d)                                      | 0,2359  |          |
| ne   | 546,07   | 1,53588 | delta Pe (F',e)  | 0,0008   |       | Pe (d,C')                                     | 0,2519  |          |
| nd   | 587,56   | 1,53359 | delta Pe (F',r)  | -0,0018  |       | Pe (e,C')                                     | 0,4878  |          |
| n632,8   | 632,80   | 1,53157 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                                      | 0,2170  |          |
| nC'  | 643,85   | 1,53114 |  |          |       | Water Resistance                              | WRs     | B        |
| n694,3   | 694,30   | 1,52940 | Acide Resistance                                       | AR*      | 2     | Pe (s,t)                                      | 0,2660  |          |
| nr   | 706,52   | 1,52903 | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>                 |         |          |
| ns   | 852,10   | 1,52561 |  |          |       | Density, g/c.cm.                              | SG      | 2,76     |
| nt   | 1 013,90 | 1,52303 | Grindability   | HG       | HG4   | T 365   | 0,972   |          |
| n1060,0  | 1 060,00 | 1,52242 | Knoop Hardness   | KH       | -     | T 400   | 0,994   |          |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 3,55  | T 440   | 0,989   |          |
| Transformation<br>Temperature, C                   | Tg       | 550     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550   | 0,996   |          |
| Expansion<br>Coefficient, 10 <sup>-7</sup> /C      | Alpha    | 93      |  |          |       | Range of Temperature, C: - 60 ... 20, C'-Line | NTabs   | 8        |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 20    | Ta  | 0,996   |          |
| <u>Other Properties</u>                            |          |         | <u>Other Properties</u>                                |          |       | Bubble  | B       | 4        |
| Bubble   |          |         |  |          |       | Farbcode                                      |         |          |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>26</b>  |          |       | <b>4 492 061 000</b>                          |         |          |



| DATA SHEET                                 |          |         | K19   |          |        | 518 616                             |         |          |
|--|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                           | nd       | 1,51878 | Abbe Number   | Vd       | 61,69  | Dispersion                          | nF-nC   | 0,008410 |
|  | ne       | 1,52079 |   | Ve       | 61,45  |                                     | nF'-nC' | 0,008475 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,53934 | nF-nC   | 0,008410 |        | Pe (i,h)                            | 0,7560  |          |
| nh   | 404,66   | 1,53293 | nF'-nC'   | 0,008475 |        | Pe (h,g)                            | 0,4439  |          |
| ng   | 435,83   | 1,52917 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,4807  |          |
| nF'  | 479,99   | 1,52509 | delta Pe (i,F')                                     | -0,0040  |        | Pe (F',e)                           | 0,5082  |          |
| n488,0                                     | 488,00   | 1,52448 | delta Pe (g,F')                                     | 0,0015   |        | Pe (e,d)                            | 0,2372  |          |
| ne   | 546,07   | 1,52079 | delta Pe (F',e)                                     | 0,0003   |        | Pe (d,C')                           | 0,2545  |          |
| nd   | 587,56   | 1,51878 | delta Pe (F',r)                                     | -0,0006  |        | Pe (e,C')                           | 0,4917  |          |
| n632,8                                     | 632,80   | 1,51700 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,2230  |          |
| nC'  | 643,85   | 1,51662 | Water Resistance                                    | WRs      | A      | Pe (r,s)                            | 0,3710  |          |
| n694,3                                     | 694,30   | 1,51507 | Acide Resistance                                    | AR*      | 1      | Pe (s,t)                            | 0,2900  |          |
| nr   | 706,52   | 1,51473 | <u>Mechanical Properties</u>                        |          |        | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,51159 | Density, g/c.cm.                                    | SG       | 2,62   | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,50913 | Grindability  | HG       | HG3    | T 365                               | 0,971   |          |
| n1060,0                                    | 1 060,00 | 1,50853 | Knoop Hardness                                      | KH       | 479,00 | T 400                               | 0,993   |          |
| <u>Termal Properties</u>                   |          |         | Photoelastic Coefficient, nm/cm 10 <sup>-5</sup> Pa | K        | 3,00   | T 440                               | 0,991   |          |
| Transformation Temperature, C              | Tg       | 505     | <u>Temperature Coefficient of Refractive Index</u>  |          |        | T 550                               | 0,995   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 80      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | 3      | T 640                               | 0,992   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 13     | Ta                                  | 0,995   |          |
|  |          |         | <u>Other Properties</u>                             |          |        | Bubble                              | B       | 3        |
|  |          |         |   |          |        | Farbcode                            | FC      | 35\31    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>17</b>   |          |        | <b>4 492 064 000</b>                |         |          |

| DATA SHEET   |          |         | K20   |          |       | 526 601                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,52638 | Abbe Number   | Vd       | 60,16 | Dispersion                          | nF-nC   | 0,008750 |
|  | ne       | 1,52847 |   | Ve       | 59,90 |                                     | nF'-nC' | 0,008822 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,54789 | nF-nC   | 0,008750 |       | Pe (i,h)                            | 0,7640  |          |
| nh   | 404,66   | 1,54115 | nF'-nC'   | 0,008822 |       | Pe (h,g)                            | 0,4468  |          |
| ng   | 435,83   | 1,53721 | <u>Deviation of Realative Partial Dispersions</u>   |          |       | Pe (g,F')                           | 0,4813  |          |
| nF'  | 479,99   | 1,53296 | delta Pe (i,F')                                     | -0,0070  |       | Pe (F',e)                           | 0,5096  |          |
| n488,0   | 488,00   | 1,53231 | delta Pe (g,F')                                     | -0,0003  |       | Pe (e,d)                            | 0,2366  |          |
| ne   | 546,07   | 1,52847 | delta Pe (F',e)                                     | 0,0007   |       | Pe (d,C')                           | 0,2539  |          |
| nd   | 587,56   | -       | delta Pe (F',r)                                     | -0,0015  |       | Pe (e,C')                           | 0,4906  |          |
| n632,8   | 632,80   | 1,52454 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2210  |          |
| nC'  | 643,85   | 1,52414 | Water Resistance                                    | WRs      | A     | Pe (r,s)                            | 0,3660  |          |
| n694,3   | 694,30   | 1,52254 | Acide Resistance                                    | AR*      | 1     | Pe (s,t)                            | 0,2850  |          |
| nr   | 706,52   | 1,52219 | <u>Internal Transmittance</u>                       |          |       | 10 mm                               |         |          |
| ns   | 852,10   | 1,51896 |   |          |       | T 365                               | 0,979   |          |
| nt   | 1 013,90 | 1,51645 |   |          |       | T 400                               | 0,991   |          |
| n1060,0  | 1 060,00 | 1,51584 |   |          |       | T 440                               | 0,987   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |       | T 550                               | 0,995   |          |
| Transformation Temperature, C                      | Tg       | 565     | Density, g/c.cm.                                    | SG       | 2,61  | T 640                               | 0,993   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 75      | Grindability  | HG       | HG4   | Ta                                  | 0,995   |          |
|  |          |         | Knoop Hardness                                      | KH       | -     |                                     |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 3,15  |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |       |                                     |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 14       |       | Bubble                              | B       | 3        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 27       |       | Farbcode                            | FC      | 34\32    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>23</b>   |          |       | <b>4 492 066 000</b>                |         |          |

| DATA SHEET                                    |          |         | K515   |          |       | 524 567                             |         |          |
|---|----------|---------|--|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                              | nd       | 1,52458 | Abbe Number  | Vd       | 56,77 | Dispersion                          | nF-nC   | 0,009240 |
|   | ne       | 1,52679 |  | Ve       | 56,64 |                                     | nF'-nC' | 0,009300 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | -       | nF-nC  | 0,009240 |       | Pe (i,h)                            | -       |          |
| nh  | 404,66   | 1,54030 | nF'-nC'  | 0,009300 |       | Pe (h,g)                            | 0,4538  |          |
| ng  | 435,83   | 1,53608 | <u>Deviation of Relative Partial Dispersions</u>       |          |       | Pe (g,F')                           | 0,4860  |          |
| nF'   | 479,99   | 1,53156 | delta Pe (i,F')  | -        |       | Pe (F',e)                           | 0,5129  |          |
| n488,0  | 488,00   | 1,53086 | delta Pe (g,F')  | -0,0003  |       | Pe (e,d)                            | 0,2377  |          |
| ne  | 546,07   | 1,52679 | delta Pe (F',e)  | 0,0023   |       | Pe (d,C')                           | 0,2494  |          |
| nd  | 587,56   | 1,52458 | delta Pe (F',r)  | 0,0019   |       | Pe (e,C')                           | 0,4871  |          |
| n632,8  | 632,80   | 1,52266 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                            | 0,2210  |          |
| nC'   | 643,85   | 1,52226 | Water Resistance                                       | WRs      | B     | Pe (r,s)                            | 0,3520  |          |
| n694,3  | 694,30   | 1,52058 | Acide Resistance                                       | AR*      | 1     | Pe (s,t)                            | 0,2690  |          |
| nr  | 706,52   | 1,52020 | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,51693 | Density, g/c.cm.                                       | SG       | 2,75  | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,51443 | Grindability   | HG       | HG4   | T 365                               | 0,965   |          |
| n1060,0                                       | 1 060,00 | 1,51384 | Knoop Hardness   | KH       | -     | T 400                               | 0,984   |          |
| <u>Thermal Properties</u>                     |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 3,70  | T 440                               | 0,990   |          |
| Transformation<br>Temperature, C              | Tg       | 500     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550                               | 0,995   |          |
| Expansion Coefficient,<br>10 <sup>-7</sup> /C | Alpha    | 81      | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | 19    | T 640                               | 0,992   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 31    | Ta                                  | 0,995   |          |
|   |          |         |  |          |       | <u>Other Properties</u>             |         |          |
|   |          |         |  |          |       | Bubble                              | B       | 4        |
|   |          |         |  |          |       | Farbcode                            | FC      | 30\28    |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>22</b>  |          |       | <b>4 492 071 000</b>                |         |          |

| DATA SHEET   |          |         | KF1   |          |       | 515 544                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,51538 | Abbe Number   | Vd       | 40,26 | Dispersion                          | nF-nC   | 0,009460 |
|  | ne       | 1,51763 |   | Ve       | 54,21 |                                     | nF'-nC' | 0,009549 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,53922 | nF-nC   | 0,009460 |       | Pe (i,h)                            | 0,8000  |          |
| nh   | 404,66   | 1,53158 | nF'-nC'   | 0,009549 |       | Pe (h,g)                            | 0,4590  |          |
| ng   | 435,83   | 1,52720 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,4899  |          |
| nF'  | 479,99   | 1,52252 | delta Pe (i,F')                                     | -0,0030  |       | Pe (F',e)                           | 0,5118  |          |
| n488,0   | 488,00   | 1,52182 | delta Pe (g,F')                                     | 0,0000   |       | Pe (e,d)                            | 0,2353  |          |
| ne   | 546,07   | 1,51763 | delta Pe (F',e)                                     | -0,0002  |       | Pe (d,C')                           | 0,2528  |          |
| nd   | 587,56   | 1,51538 | delta Pe (F',r)                                     | -0,0004  |       | Pe (e,C')                           | 0,4881  |          |
| n632,8   | 632,80   | 1,51340 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2180  |          |
| nC'  | 643,85   | 1,51297 | Water Resistance                                    | WRs      | A     | Pe (r,s)                            | 0,3570  |          |
| n694,3   | 694,30   | 1,51126 | Acide Resistance                                    | AR*      | 1     | Pe (s,t)                            | 0,2770  |          |
| nr   | 706,52   | 1,51089 | <u>Internal Transmittance</u>                       |          |       | 10 mm                               |         |          |
| ns   | 852,10   | 1,50748 | T 365   |          | 0,955 | T 400                               |         |          |
| nt   | 1 013,90 | 1,50483 | T 440   |          | 0,977 | T 550                               |         |          |
| n1060,0  | 1 060,00 | 1,50419 | T 640   |          | 0,992 | T a                                 |         |          |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |       | 0,994                               |         |          |
| Transformation Temperature, C                      | Tg       | 510     | Density, g\c.cm.                                    | SG       | 2,69  | 0,994                               |         |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 66      | Grindability  | HG       | HG3   | 0,992                               |         |          |
|  |          |         | Knoop Hardness                                      | KH       | -     | 0,994                               |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 3,20  |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |       |                                     |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 12       |       | Bubble                              | B       | 5        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 29       |       | Farbcode                            | FC      | 35\32    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>13</b>   |          |       | <b>4 492 201 000</b>                |         |          |

| DATA SHEET   |          |         | KF4  |          |       | 518 589                             |         |          |           |
|--|----------|---------|--|----------|-------|-------------------------------------|---------|----------|-----------|
| Refractive Index                                   | nd       | 1,51818 | Abbe Number                                      | Vd       | 58,95 | Dispersion                          | nF-nC   | 0,008790 |           |
|  | ne       | 1,52027 |  | Ve       | 58,71 |                                     | nF'-nC' | 0,008861 |           |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                       |          |       | <u>Relative Partial Dispersions</u> |         |          |           |
| ni   | 365,00   | 1,53982 | nF-nC  | 0,008790 |       | Pe (i,h)                            | 0,7670  |          |           |
| nh   | 404,66   | 1,53302 | nF'-nC'  | 0,008861 |       | Pe (h,g)                            | 0,4480  |          |           |
| ng   | 435,83   | 1,52905 | <u>Deviation of Relative Partial Dispersions</u> |          |       | Pe (g,F')                           | 0,4814  |          |           |
| nF'  | 479,99   | 1,52478 |  |          |       | delta Pe (i,F')                     | -0,0140 |          | Pe (F',e) |
| n488,0   | 488,00   | 1,52413 | delta Pe (g,F')                                  | -0,0020  |       | Pe (e,d)                            | 0,2359  |          |           |
| ne   | 546,07   | 1,52027 | delta Pe (F',e)                                  | -0,1001  |       | Pe (d,C')                           | 0,2548  |          |           |
| nd   | 587,56   | 1,51818 | delta Pe (F',r)                                  | -0,0002  |       | Pe (e,C')                           | 0,4907  |          |           |
| n632,8   | 632,80   | 1,51632 | <u>Chemical Properties</u>                       |          |       | Pe (C,r)                            | 0,2210  |          |           |
| nC'  | 643,85   | 1,51592 |  |          |       | Water Resistance                    | WRs     | A        | Pe (r,s)  |
| n694,3   | 694,30   | 1,51431 | Acide Resistance                                 | AR*      | 1     | <u>Internal Transmittance</u>       |         |          |           |
| nr   | 706,52   | 1,51396 | <u>Mechanical Properties</u>                     |          |       | 10 mm                               |         |          |           |
| ns   | 852,10   | 1,51069 |  |          |       | Density, g/c.cm.                    | SG      | 2,57     | T 365     |
| nt   | 1 013,90 | 1,50811 | Grindability                                     | HG       | HG4   | T 400                               | 0,989   |          |           |
| n1060,0  | 1 060,00 | 1,50748 | Knoop Hardness                                   | KH       | -     | T 440                               | 0,989   |          |           |
| <u>Thermal Properties</u>                          |          |         | Photoelastic Coefficient, nm\cm                  | K        | 3,00  | T 550                               | 0,996   |          |           |
| Transformation Temperature, C                      | Tg       | 530     | 10 <sup>-5</sup> Pa                              |          |       |                                     | T 640   | 0,993    |           |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 71      |  |          |       | Ta                                  | 0,996   |          |           |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |  |          |       | <u>Other Properties</u>             |         |          |           |
| Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    | 16      |  |          |       | Bubble                              | B       | 4        |           |
| Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    | 31      |  |          |       | Farbcode                            | FC      | 35\32    |           |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>16</b>  |          |       | <b>4 492 202 000</b>                |         |          |           |

| DATA SHEET   |          |         | KF6  |          |       | 500 572                              |         |          |
|--|----------|---------|--|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,50058 | Abbe Number  | Vd       | 41,83 | Dispersion                           | nF-nC   | 0,008750 |
|  | ne       | 1,50266 |  | Ve       | 56,96 |                                      | nF'-nC' | 0,008825 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                           |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,52229 | nF-nC  | 0,008750 |       | Pe (i,h)                             | 0,7770  |          |
| nh   | 404,66   | 1,51543 | nF'-nC'  | 0,008825 |       | Pe (h,g)                             | 0,4508  |          |
| ng   | 435,83   | 1,51145 | <u>Deviation of Relative Partial Dispersions</u>     |          |       | Pe (g,F')                            | 0,4855  |          |
| nF'  | 479,99   | 1,50717 | delta Pe (i,F')                                      | -0,0130  |       | Pe (F',e)                            | 0,5109  |          |
| n488,0   | 488,00   | 1,50652 | delta Pe (g,F')                                      | -0,0003  |       | Pe (e,d)                             | 0,2355  |          |
| ne   | 546,07   | 1,50266 | delta Pe (F',e)                                      | -        |       | Pe (d,C')                            | 0,2536  |          |
| nd   | 587,56   | 1,50058 | delta Pe (F',r)                                      | -0,0004  |       | Pe (e,C')                            | 0,4891  |          |
| n632,8   | 632,80   | 1,49874 | <u>Chemical Properties</u>                           |          |       | Pe (C,r)                             | 0,2200  |          |
| nC'  | 643,85   | 1,49834 | Water Resistance                                     | WRs      | B     | Pe (r,s)                             | 0,3640  |          |
| n694,3   | 694,30   | 1,49674 | Acide Resistance                                     | AR*      | 1     | Pe (s,t)                             | 0,2830  |          |
| nr   | 706,52   | 1,49640 |  |          |       | <u>Internal Transmittance</u>        |         |          |
| ns   | 852,10   | 1,49319 |  |          |       | 10 mm                                |         |          |
| nt   | 1 013,90 | 1,49069 |  |          |       | T 365                                | 0,978   |          |
| n1060,0  | 1 060,00 | 1,49009 |  |          |       | T 400                                | 0,993   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                         |          |       | T 440                                | 0,989   |          |
| Transformation Temperature, C                      | Tg       | 460     | Density, g/c.cm.                                     | SG       | 2,52  | T 550                                | 0,995   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 68      | Grindability   | HG       | HG4   | T 640                                | 0,991   |          |
|  |          |         | Knoop Hardness                                       | KH       | -     | Ta                                   | 0,995   |          |
|  |          |         | Photoelastic Coefficient, nm/lcm 10 <sup>-5</sup> Pa | K        | 3,10  |                                      |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |  |          |       | <u>Other Properties</u>              |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs  | 20       |       | Bubble                               | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs  | 36       |       | Farbcode                             | FC      | 33\30    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>9</b>   |          |       | <b>4 492 205 000</b>                 |         |          |

| DATA SHEET   |          |         | KF7   |          |       | 517 511                              |         |          |
|--|----------|---------|---|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,51759 | Abbe Number   | Vd       | 51,15 | Dispersion                           | nF-nC   | 0,010120 |
|  | ne       | 1,52000 |   | Ve       | 50,87 |                                      | nF'-nC' | 0,010223 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,54363 | nF-nC   | 0,010120 |       | Pe (i,h)                             | 0,8320  |          |
| nh   | 404,66   | 1,53512 | nF'-nC'   | 0,010223 |       | Pe (h,g)                             | 0,4690  |          |
| ng   | 435,83   | 1,53032 | <u>Deviation of Realative Partial Dispersions</u>   |          |       | Pe (g,F')                            | 0,4958  |          |
| nF'  | 479,99   | 1,52526 | delta Pe (i,F')                                     | 0,0140   |       | Pe (F',e)                            | 0,5136  |          |
| n488,0   | 488,00   | 1,52449 | delta Pe (g,F')                                     | 0,00080  |       | Pe (e,d)                             | 0,2362  |          |
| ne   | 546,07   | 1,52000 | delta Pe (F',e)                                     | -0,00030 |       | Pe (d,C')                            | 0,2501  |          |
| nd   | 587,56   | 1,51759 | delta Pe (F',r)                                     | -0,00040 |       | Pe (e,C')                            | 0,4863  |          |
| n632,8   | 632,80   | 1,51549 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                             | 0,2150  |          |
| nC'  | 643,85   | 1,51503 | Water Resistance                                    | WRs      | A     | Pe (r,s)                             | 0,3520  |          |
| n694,3   | 694,30   | 1,51322 | Acide Resistance                                    | AR*      | 1     | Pe (s,t)                             | 0,2700  |          |
| nr   | 706,52   | 1,51283 | <u>Internal Transmittance</u>                       |          |       | 10 mm                                |         |          |
| ns   | 852,10   | 1,50923 |   |          |       | T 365                                | -       |          |
| nt   | 1 013,90 | 1,50647 |   |          |       | T 400                                | 0,9670  |          |
| n1060,0  | 1 060,00 | -       |   |          |       | T 440                                | 0,9800  |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |       | T 550                                | 0,9890  |          |
| Transformation Temperature, C                      | Tg       | 520     | Density, g/c.cm.                                    | SG       | 2,51  | T 640                                | 0,9830  |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 59      | Grindability  | HG       | HG3   | Ta                                   | 0,9890  |          |
|  |          |         | Knoop Hardness                                      | KH       | -     |                                      |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 3,25  |                                      |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>              |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 23       |       | Bubble                               | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 40       |       | Farbcode                             | FC      | 38\36    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>15</b>   |          |       | <b>4 492 207 000</b>                 |         |          |

| DATA SHEET   |          |         | FK11  |          |       | 519 691                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,51997 | Abbe Number   | Vd       | 69,14 | Dispersion                          | nF-nC   | 0,007520 |
|  | ne       | 1,52176 |   | Ve       | 68,92 |                                     | nF'-nC' | 0,007570 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1.53809 | nF-nC   | 0,007520 |       | Pe (i,h)                            | 0,7380  |          |
| nh   | 404,66   | 1.53250 | nF'-nC'   | 0,007570 |       | Pe (h,g)                            | 0,4378  |          |
| ng   | 435,83   | 1.52919 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0.4744  |          |
| nF'  | 479,99   | 1.52559 | delta Pe (i,F')                                     | -        |       | Pe (F',e)                           | 0.5067  |          |
| n488,0   | 488,00   | 1,52505 | delta Pe (g,F')                                     | 0,0064   |       | Pe (e,d)                            | 0.2363  |          |
| ne   | 546,07   | 1.52176 | delta Pe (F',e)                                     | 0,0030   |       | Pe (d,C')                           | 0.2570  |          |
| nd   | 587,56   | 1.51997 | delta Pe (F',r)                                     | -0,0025  |       | Pe (e,C')                           | 0.4933  |          |
| n632,8   | 632,80   | 1,51837 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2260  |          |
| nC'  | 643,85   | 1.51802 | Water Resistance                                    | WRs      | u     | Pe (r,s)                            | 0,3830  |          |
| n694,3   | 694,30   | 1,51661 | Acide Resistance                                    | AR*      | 1     | Pe (s,t)                            | 0,3090  |          |
| nr   | 706,52   | 1.51631 |   |          |       | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,51341 |   |          |       | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,51107 |   |          |       | T 365                               | 0,960   |          |
| n1060,0  | 1 060,00 | 1,51048 |   |          |       | T 400                               | 0,993   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |       | T 440                               | 0,998   |          |
| Transformation Temperature, C                      | Tg       | 525     | Density, g\c.cm.                                    | SG       | 2,60  | T 550                               | 0,998   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 89      | Grindability  | HG       | HG2   | T 640                               | 0,994   |          |
|  |          |         | Knoop Hardness                                      | KH       | -     | Ta                                  | 0,998   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,35  |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | -22      |       | Bubble                              | B       | 5        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | -5       |       | Farbcode                            | FC      | 35\32    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>18</b>   |          |       | <b>4 492 021 000</b>                |         |          |



| DATA SHEET   |          |         | FK13  |          |           | 579 716                              |         |          |
|--|----------|---------|---|----------|-----------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,57998 | Abbe Number   | Vd       | 71,69     | Dispersion                           | nF-nC   | 0,008090 |
|  | ne       | 1,58211 |   | Ve       | 67,40     |                                      | nF'-nC' | 0,008143 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | -       | nF-nC   | 0,008090 | Pe (i,h)  | -                                    |         |          |
| nh   | 404,66   | 1,59433 | nF'-nC'   | 0,008143 | Pe (h,g)  | 0,4418                               |         |          |
| ng   | 435,83   | 1,59096 |   |          | Pe (g,F') | 0,4778                               |         |          |
| nF'  | 479,99   | 1,58667 | <u>Deviation of Realative Partial Dispersions</u>   |          |           | Pe (F',e)                            | 0,5083  |          |
| n488,0   | 488,00   | 1,55234 | delta Pe (i,F')                                     | 0,0110   | Pe (e,d)  | 0,2369                               |         |          |
| ne   | 546,07   | 1,58211 | delta Pe (g,F')                                     | 0,0031   | Pe (d,C') | 0,2548                               |         |          |
| nd   | 587,56   | 1,57998 | delta Pe (F',e)                                     | 0,0009   | Pe (e,C') | 0,4917                               |         |          |
| n632,8   | 632,80   | 1,54515 | delta Pe (F',r)                                     | -0,0008  | Pe (C,r)  | 0,2220                               |         |          |
| nC'  | 643,85   | 1,57769 | <u>Chemical Properties</u>                          |          |           | Pe (r,s)                             | 0,3680  |          |
| n694,3   | 694,30   | 1,54326 | Water Resistance                                    | WRs      | u         | Pe (s,t)                             | 0,2850  |          |
| nr   | 706,52   | 1,57570 | Acide Resistance                                    | AR*      | 1         | <u>Internal Transmittance</u>        |         |          |
| ns   | 852,10   | 1,57240 |   |          |           | 10 mm                                |         |          |
| nt   | 1 013,90 | 1,56984 |   |          |           | T 365                                | 0,949   |          |
| n1060,0  | 1 060,00 | 1,53672 |   |          |           | T 400                                | 0,992   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                                | 0,992   |          |
| Transformation Temperature, C                      | Tg       | 555     | Density, g\c.cm.                                    | SG       | 2,93      | T 550                                | 0,996   |          |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 73      | Grindability  | HG       | HG2       | T 640                                | 0,994   |          |
|  |          |         | Knoop Hardness                                      | KH       | -         | Ta                                   | 0,996   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,20      |                                      |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |           |                                      |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    | -1      |   |          |           | Bubble                               | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    | 10      |   |          |           | Farbcode                             | FC      | 35\33    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>44</b>   |          |           | <b>4 492 022 000</b>                 |         |          |

| DATA SHEET                                      |          |         | FK14   |          |       | 579 650                              |         |          |
|---|----------|---------|--|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                                | nd       | 1,57998 | Abbe Number  | Vd       | 65,09 | Dispersion                           | nF-nC   | 0,008910 |
|   | ne       | 1,58211 |  | Ve       | 64,83 |                                      | nF'-nC' | 0,008979 |
| <u>Refractive Indices</u>                       |          |         | <u>Partial Dispersions</u>                               |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni  | 365,00   | -       | nF-nC  | 0,008910 |       | Pe (i,h)                             | -       |          |
| nh  | 404,66   | 1,59493 | nF'-nC'  | 0,008979 |       | Pe (h,g)                             | 0,4418  |          |
| ng  | 435,83   | 1,59096 | <u>Deviation of Realative Partial Dispersions</u>        |          |       | Pe (g,F')                            | 0,4778  |          |
| nF'   | 479,99   | 1,58667 | delta Pe (i,F')  | -        |       | Pe (F',e)                            | 0,5083  |          |
| n488,0  | 488,00   | 1,58602 | delta Pe (g,F')  | 0,0037   |       | Pe (e,d)                             | 0,2369  |          |
| ne  | 546,07   | 1,58211 | delta Pe (F',e)  | 0,0024   |       | Pe (d,C')                            | 0,2548  |          |
| nd  | 587,56   | 1,57998 | delta Pe (F',r)  | -0,0040  |       | Pe (e,C')                            | 0,4917  |          |
| n632,8  | 632,80   | 1,57810 | <u>Chemical Properties</u>                               |          |       | Pe (C,r)                             | 0,2220  |          |
| nC'   | 643,85   | 1,57769 | Water Resistance   | WRs      | SG    | Pe (r,s)                             | 0,3680  |          |
| n694,3  | 694,30   | 1,57605 | Acide Resistance   | AR*      | 5     | Pe (s,t)                             | 0,2850  |          |
| nr  | 706,52   | 1,57570 | <u>Mechanical Properties</u>                             |          |       | <u>Internal Transmittance</u>        |         |          |
| ns  | 852,10   | 1,57240 | Density, g\c.cm.   | SG       | 3,39  | 10 mm                                |         |          |
| nt  | 1 013,90 | 1,56984 | Grindability   | HG       | HG2   | T 365                                | 0,880   |          |
| n1060,0   | 1 060,00 | 1,56922 | Knoop Hardness   | KH       | -     | T 400                                | 0,985   |          |
| <u>Termal Properties</u>                        |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>^</sup> -5 Pa | K        | 1,45  | T 440                                | 0,989   |          |
| Transformation<br>Temperature, C                | Tg       | 510     | <u>Temperature Coefficient of Refractive Index</u>       |          |       | T 550                                | 0,995   |          |
| Exspansion<br>Coefficient, 10 <sup>^</sup> -7/C | Alpha    | 97      | Range of Temperature, C: - 60 ... 20, C'-Line            | NTabs    | -46   | T 640                                | 0,992   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line             | NTabs    | -38   | Ta                                   | 0,995   |          |
|   |          |         | <u>Other Properties</u>                                  |          |       | Bubble                               | B       | 4        |
|   |          |         |  |          |       | Farbcode                             | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                        |          |         | <b>43</b>  |          |       | <b>4 492 024 000</b>                 |         |          |

| DATA SHEET   |          |         | FK24  |          |       | 581 647                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,58158 | Abbe Number   | Vd       | 64,76 | Dispersion                          | nF-nC   | 0,008980 |
|  | ne       | 1,58372 |   | Ve       | 64,49 |                                     | nF'-nC' | 0,009052 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,60345 | nF-nC   | 0,008980 |       | Pe (i,h)                            | 0,7480  |          |
| nh   | 404,66   | 0,59668 | nF'-nC'   | 0,009052 |       | Pe (h,g)                            | 0,4433  |          |
| ng   | 435,83   | 1,59267 | <u>Deviation of Realative Partial Dispersions</u>   |          |       | Pe (g,F')                           | 0,4793  |          |
| nF'  | 479,99   | 1,58833 |   |          |       | delta Pe (i,F')                     | 0,0140  |          |
| n488,0   | 488,00   | 1,58767 | delta Pe (g,F')                                     | 0,0046   |       | Pe (e,d)                            | 0,2367  |          |
| ne   | 546,07   | 1,58372 | delta Pe (F',e)                                     | 0,0028   |       | Pe (d,C')                           | 0,2544  |          |
| nd   | 587,56   | 1,58158 | delta Pe (F',r)                                     | -0,0037  |       | Pe (e,C')                           | 0,4912  |          |
| n632,8   | 632,80   | 1,57968 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2220  |          |
| nC'  | 643,85   | 1,57928 |   |          |       | Water Resistance                    | WRs     | SG       |
| n694,3   | 694,30   | 1,57763 | Acide Resistance                                    | AR*      | 3     | <u>Internal Transmittance</u>       |         |          |
| nr   | 706,52   | 1,57727 |   |          |       | 10 mm                               |         |          |
| ns   | 852,10   | 1,57396 |   |          |       | T 365                               | 0,891   |          |
| nt   | 1 013,90 | 1,57139 | T 400   | 0,980    |       |                                     |         |          |
| n1060,0  | 1 060,00 | 1,57076 | T 440   | 0,981    |       |                                     |         |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |       | T 550                               | 0,996   |          |
|  |          |         |   |          |       | T 640                               | 0,993   |          |
| Transformation Temperature, C                      | Tg       | 555     | Density, g/c.cm.                                    | SG       | 3,41  | Ta                                  | 0,996   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 96      | Grindability  | HG       | HG2   |                                     |         |          |
|  |          |         | Knoop Hardness                                      | KH       | -     |                                     |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,45  |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | -50      |       | Bubble                              | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | -37      |       | Farbcode                            | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>46</b>   |          |       | <b>4 492 026 000</b>                |         |          |

| DATA SHEET                                 |          |         | OK1   |          |       | 522 763                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                           | nd       | 1,52226 | Abbe Number   | Vd       | 76,35 | Dispersion                          | nF-nC   | 0,006840 |
|  | ne       | 1,52389 |   | Ve       | 75,98 |                                     | nF'-nC' | 0,006895 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,53891 | nF-nC   | 0,006840 |       | Pe (i,h)                            | 0,7480  |          |
| nh   | 404,66   | 1,53375 | nF'-nC'   | 0,006895 |       | Pe (h,g)                            | 0,4414  |          |
| ng   | 435,83   | 1,53071 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,4791  |          |
| nF'  | 479,99   | 1,52740 | delta Pe (i,F')                                     | 0,1200   |       | Pe (F',e)                           | 0,5090  |          |
| n488,0                                     | 488,00   | 1,52690 | delta Pe (g,F')                                     | 0,0215   |       | Pe (e,d)                            | 0,2367  |          |
| ne   | 546,07   | 1,52389 | delta Pe (F',e)                                     | 0,0093   |       | Pe (d,C')                           | 0,2544  |          |
| nd   | 587,56   | 1,52226 | delta Pe (F',r)                                     | -0,0124  |       | Pe (e,C')                           | 0,4910  |          |
| n632,8                                     | 632,80   | 1,52082 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2220  |          |
| nC'  | 643,85   | 1,52051 | Water Resistance                                    | WRs      | s     | Pe (r,s)                            | 0,3630  |          |
| n694,3                                     | 694,30   | 1,51925 | Acide Resistance                                    | AR*      | 4     | Pe (s,t)                            | 0,2780  |          |
| nr   | 706,52   | 1,51898 | <u>Mechanical Properties</u>                        |          |       | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,51648 | Density, g/cm.                                      | SG       | 3,77  | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,51456 | Grindability  | HG       | HG1   | T 365                               | 0,993   |          |
| n1060,0                                    | 1 060,00 | 1,51410 | Knoop Hardness                                      | KH       | -     | T 400                               | 0,994   |          |
| <u>Termal Properties</u>                   |          |         | Photoelastic Coefficient, nm/cm 10 <sup>-5</sup> Pa | K        | 0,65  | T 440                               | 0,989   |          |
| Transformation Temperature, C              | Tg       | 440     | <u>Temperature Coefficient of Refractive Index</u>  |          |       | T 550                               | 0,996   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 137     | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | -80   | T 640                               | 0,990   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | -81   | Ta                                  | 0,996   |          |
|  |          |         |   |          |       | <u>Other Properties</u>             |         |          |
|  |          |         |   |          |       | Bubble                              | B       | 5        |
|  |          |         |   |          |       | Farbcode                            | FC      | 28\25    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>19</b>   |          |       | <b>4 492 192 000</b>                |         |          |

| DATA SHEET   |          |         | OK2   |          |       | 550 730                              |         |          |           |
|--|----------|---------|---|----------|-------|--------------------------------------|---------|----------|-----------|
| Refractive Index                                   | nd       | 1,55027 | Abbe Number                                       | Vd       | 73,08 | Dispersion                           | nF-nC   | 0,007530 |           |
|  | ne       | 1,55206 |   | Ve       | 72,72 |                                      | nF'-nC' | 0,007592 |           |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                        |          |       | <u>Realative Partial Dispersions</u> |         |          |           |
| ni   | 365,00   | 1,56862 | nF-nC   | 0,007530 |       | Pe (i,h)                             | 0,7500  |          |           |
| nh   | 404,66   | 1,56293 | nF'-nC'   | 0,007592 |       | Pe (h,g)                             | 0,4427  |          |           |
| ng   | 435,83   | 1,55957 | <u>Deviation of Realative Partial Dispersions</u> |          |       | Pe (g,F')                            | 0,4793  |          |           |
| nF'  | 479,99   | 1,55593 |   |          |       | delta Pe (i,F')                      | 0,0920  |          | Pe (F',e) |
| n488,0   | 488,00   | 1,55538 | delta Pe (g,F')                                   | 0,0168   |       | Pe (e,d)                             | 0,2368  |          |           |
| ne   | 546,07   | 1,55206 | delta Pe (F',e)                                   | 0,0078   |       | Pe (d,C')                            | 0,2540  |          |           |
| nd   | 587,56   | 1,55027 | delta Pe (F',r)                                   | -0,0120  |       | Pe (e,C')                            | 0,4908  |          |           |
| n632,8   | 632,80   | 1,54868 | <u>Chemical Properties</u>                        |          |       | Pe (C,r)                             | 0,2200  |          |           |
| nC'  | 643,85   | 1,54834 |   |          |       | Water Resistance                     | WRs     | s        | Pe (r,s)  |
| n694,3   | 694,30   | 1,54696 | Acide Resistance                                  | AR*      | 4     | <u>Internal Transmittance</u>        |         |          |           |
| nr   | 706,52   | 1,54667 | <u>Mechanical Properties</u>                      |          |       | 10 mm                                |         |          |           |
| ns   | 852,10   | 1,54393 |   |          |       | Density, g/c.cm.                     | SG      | 3,82     | T 365     |
| nt   | 1 013,90 | 1,54184 | Grindability                                      | HG       | HG1   | T 400                                | 0,993   |          |           |
| n1060,0  | 1 060,00 | 1,54135 | Knoop Hardness                                    | KH       | -     | T 440                                | 0,985   |          |           |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient, nm\cm                   | K        | 0,60  | T 550                                | 0,997   |          |           |
| Transformation Temperature, C                      | Tg       | 490     | 10 <sup>-5</sup> Pa                               |          |       |                                      | T 640   | 0,991    |           |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 130     |   |          |       | Ta                                   | 0,997   |          |           |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>              |         |          |           |
| Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    | -82     |   |          |       | Bubble                               | B       | 5        |           |
| Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    | -79     |   |          |       | Farbcode                             | FC      | 33\30    |           |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>32</b>   |          |       | <b>4 492 193 000</b>                 |         |          |           |

| DATA SHEET   |          |         | BK4   |          |          | 530 604                              |         |          |
|--|----------|---------|---|----------|----------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,53028 | Abbe Number   | Vd       | 60,47    | Dispersion                           | nF-nC   | 0,008770 |
|  | ne       | 1,53237 |   | Ve       | 60,20    |                                      | nF'-nC' | 0,008843 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |          | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,55180 | nF-nC   | 0,008770 |          | Pe (i,h)                             | 0,7600  |          |
| nh   | 404,66   | 1,54508 | nF'-nC'   | 0,008843 |          | Pe (h,g)                             | 0,4469  |          |
| ng   | 435,83   | 1,54113 | <u>Deviation of Realative Partial Dispersions</u>   |          |          | Pe (g,F')                            | 0,4807  |          |
| nF'  | 479,99   | 1,53688 |   |          |          | delta Pe (i,F')                      | -0,0090 |          |
| n488,0   | 488,00   | 1,53622 | delta Pe (g,F')                                     | -0,0003  |          | Pe (e,d)                             | 0,2362  |          |
| ne   | 546,07   | 1,53237 | delta Pe (F',e)                                     | 0,0020   |          | Pe (d,C')                            | 0,2539  |          |
| nd   | 587,56   | 1,53028 | delta Pe (F',r)                                     | -0,0028  |          | Pe (e,C')                            | 0,4900  |          |
| n632,8   | 632,80   | 1,52843 | <u>Chemical Properties</u>                          |          |          | Pe (C,r)                             | 0,2200  |          |
| nC'  | 643,85   | 1,52803 |   |          |          | Water Resistance                     | WRs     | A        |
| n694,3   | 694,30   | 1,52643 | Acide Resistance                                    | AR*      | 1        | <u>Internal Transmittance</u>        |         |          |
| nr   | 706,52   | 1,52609 |   |          |          | 10 mm                                |         |          |
| ns   | 852,10   | 1,52287 |   |          |          | T 365                                | 0,946   |          |
| nt   | 1 013,90 | 1,52038 | T 400   | 0,984    |          |                                      |         |          |
| n1060,0  | 1 060,00 | 1,51978 | T 440   | 0,986    |          |                                      |         |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |          | T 550                                | 0,995   |          |
| Transformation Temperature, C                      | Tg       | 555     | Density, g/c.cm.                                    | SG       | 2,76     | T 640                                | 0,993   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 78      | Grindability  | HG       | HG3      | Ta                                   | 0,995   |          |
|  |          |         | Knoop Hardness                                      | KH       | -        |                                      |         |          |
|  |          |         | Photoelastic Coefficient, nm/cm 10 <sup>-5</sup> Pa | K        | 3,00     |                                      |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |          | <u>Other Properties</u>              |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          | NTabs   | 9   |          | Bubble   |                                      | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          | NTabs   | 23  |          | Farbcode |                                      | FC      | 34/31    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>25</b>   |          |          | <b>4 492 081 000</b>                 |         |          |

| DATA SHEET                                 |          |         | BK6   |          |       | 539 596                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                           | nd       | 1,53998 | Abbe Number   | Vd       | 59,67 | Dispersion                          | nF-nC   | 0,009050 |
|  | ne       | 1,54214 |   | Ve       | 59,40 |                                     | nF'-nC' | 0,009127 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,56226 | nF-nC   | 0,009050 |       | Pe (i,h)                            | 0,7640  |          |
| nh   | 404,66   | 1,55529 | nF'-nC'   | 0,009127 |       | Pe (h,g)                            | 0,4476  |          |
| ng   | 435,83   | 1,55120 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,4835  |          |
| nF'  | 479,99   | 1,54679 | delta Pe (i,F')                                     | -0,0090  |       | Pe (F',e)                           | 0,5101  |          |
| n488,0                                     | 488,00   | 1,54612 | delta Pe (g,F')                                     | 0,0011   |       | Pe (e,d)                            | 0,2359  |          |
| ne   | 546,07   | 1,54214 | delta Pe (F',e)                                     | 0,0010   |       | Pe (d,C')                           | 0,2540  |          |
| nd   | 587,56   | 1,53998 | delta Pe (F',r)                                     | -0,0100  |       | Pe (e,C')                           | 0,4900  |          |
| n632,8                                     | 632,80   | 1,53808 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2200  |          |
| nC'  | 643,85   | 1,53766 | Water Resistance                                    | WRs      | A     | Pe (r,s)                            | 0,3640  |          |
| n694,3                                     | 694,30   | 1,53601 | Acide Resistance                                    | AR*      | 1     | Pe (s,t)                            | 0,2780  |          |
| nr   | 706,52   | 1,53566 | <u>Mechanical Properties</u>                        |          |       | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,53234 | Density, g\c.cm.                                    | SG       | 2,86  | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,52980 | Grindability  | HG       | HG3   | T 365                               | 0,983   |          |
| n1060,0                                    | 1 060,00 | 1,52920 | Knoop Hardness                                      | KH       | -     | T 400                               | 0,991   |          |
| <u>Thermal Properties</u>                  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,70  | T 440                               | 0,990   |          |
| Transformation Temperature, C              | Tg       | 560     | <u>Temperature Coefficient of Refractive Index</u>  |          |       | T 550                               | 0,996   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 82      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | 0     | T 640                               | 0,992   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 13    | Ta                                  | 0,996   |          |
|  |          |         | <u>Other Properties</u>                             |          |       | Bubble                              | B       | 4        |
|  |          |         |   |          |       | Farbcode                            | FC      | 34\32    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>27</b>   |          |       | <b>4 492 083 000</b>                |         |          |

| DATA SHEET   |          |         | BK8   |          |          | 546 627                             |         |          |
|--|----------|---------|---|----------|----------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,54678 | Abbe Number   | Vd       | 62,78    | Dispersion                          | nF-nC   | 0,008710 |
|  | ne       | 1,54886 |   | Ve       | 62,56    |                                     | nF'-nC' | 0,008774 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |          | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,56796 | nF-nC   | 0,008710 |          | Pe (i,h)                            | 0,7510  |          |
| nh   | 404,66   | 1,56137 | nF'-nC'   | 0,008774 |          | Pe (h,g)                            | 0,4406  |          |
| ng   | 435,83   | 1,55750 | <u>Deviation of Relative Partial Dispersions</u>    |          |          | Pe (g,F')                           | 0,4778  |          |
| nF'  | 479,99   | 1,55331 | delta Pe (i,F')                                     | 0,0050   |          | Pe (F',e)                           | 0,5073  |          |
| n488,0   | 488,00   | 1,55268 | delta Pe (g,F')                                     | 0,0002   |          | Pe (e,d)                            | 0,2373  |          |
| ne   | 546,07   | 1,54886 | delta Pe (F',e)                                     | 0,0001   |          | Pe (d,C')                           | 0,2554  |          |
| nd   | 587,56   | 1,54678 | delta Pe (F',r)                                     | -0,0012  |          | Pe (e,C')                           | 0,4927  |          |
| n632,8   | 632,80   | 1,54494 | <u>Chemical Properties</u>                          |          |          | Pe (C,r)                            | 0,2230  |          |
| nC'  | 643,85   | 1,54454 | Water Resistance                                    | WRs      | A        | Pe (r,s)                            | 0,3750  |          |
| n694,3   | 694,30   | 1,54292 | Acide Resistance                                    | AR*      | 4        | Pe (s,t)                            | 0,2970  |          |
| nr   | 706,52   | 1,54258 | <u>Internal Transmittance</u>                       |          |          | 10 mm                               |         |          |
| ns   | 852,10   | 1,53929 | T 365   |          |          | 0,928                               |         |          |
| nt   | 1 013,90 | 1,53668 | T 400   |          |          | 0,986                               |         |          |
| n1060,0  | 1 060,00 | 1,53604 | T 440   |          |          | 0,987                               |         |          |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |          | T 550                               |         |          |
| Transformation Temperature, C                      | Tg       | 595     | Density, g/c.cm.                                    | SG       | 2,85     | T 640                               |         |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 62      | Grindability  | HG       | HG4      | 0,994                               |         |          |
|  |          |         | Knoop Hardness                                      | KH       | -        | Ta                                  |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,85     | 0,995                               |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |          | Bubble                              |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          | NTabs   | 13  |          | Farbcode |                                     |         |          |
| Range of Temperature, C: 20 ... 120, C'-Line       |          | NTabs   | 29  |          | FC 35\32 |                                     |         |          |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>29</b>   |          |          | <b>4 492 085 000</b>                |         |          |



| DATA SHEET   |          |         | BK10  |          |       | 568 560                             |         |             |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|-------------|
| Refractive Index                                   | nd       | 1,56889 | Abbe Number   | Vd       | 56,05 | Dispersion                          | nF-nC   | 0,010150    |
|  | ne       | 1,57131 |   | Ve       | 55,76 |                                     | nF'-nC' | 0,010245    |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                                |          |       | <u>Relative Partial Dispersions</u> |         |             |
| ni   | 365,00   | 1,59417 | nF-nC   | 0,010150 |       | Pe (i,h)                            | 0,7780  |             |
| nh   | 404,66   | 1,58620 | nF'-nC'   | 0,010245 |       | Pe (h,g)                            | 0,4545  |             |
| ng   | 435,83   | 1,58154 | <u>Deviation of Relative Partial Dispersions</u>          |          |       | Pe (g,F')                           | 0,4871  |             |
| nF'  | 479,99   | 1,57655 |   |          |       | delta Pe (i,F')                     | -0,0180 |             |
| n488,0   | 488,00   | 1,57580 | delta Pe (g,F')   | -0,0006  |       | Pe (e,d)                            | 0,2360  |             |
| ne   | 546,07   | 1,57131 | delta Pe (F',e)   | 0,0008   |       | Pe (d,C')                           | 0,2522  |             |
| nd   | 587,56   | 1,56889 | delta Pe (F',r)   | -0,0020  |       | Pe (e,C')                           | 0,4881  |             |
| n632,8   | 632,80   | 1,56676 | <u>Chemical Properties</u>                                |          |       | Pe (C,r)                            | 0,2170  |             |
| nC'  | 643,85   | 1,56631 |   |          |       | Water Resistance                    | WRs     | A           |
| n694,3   | 694,30   | 1,56448 | Acide Resistance  | AR*      | 4     | <u>Internal Transmittance</u>       |         |             |
| nr   | 706,52   | 1,56408 | <u>Mechanical Properties</u>                              |          |       | 10 mm                               |         |             |
| ns   | 852,10   | 1,56047 |   |          |       | Density, g/c.cm.                    | SG      | 3,12        |
| nt   | 1 013,90 | 1,55774 | Grindability  | HG       | HG3   | T 400                               | 0,987   |             |
| n1060,0  | 1 060,00 | 1,55709 | Knoop Hardness  | KH       | -     | T 440                               | 0,990   |             |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient,<br>nm/lcm 10 <sup>^</sup> -5 Pa | K        | 3,00  | T 550                               | 0,997   |             |
| Transformation<br>Temperature, C                   | Tg       | 575     | <u>Temperature Coefficient of Refractive Index</u>        |          |       | T 640                               | 0,995   |             |
| Exspansion<br>Coefficient, 10 <sup>^</sup> -7/C    | Alpha    | 70      |   |          |       | NTabs                               | 16      | Ta          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                                   |          |       | Bubble B 3                          |         |             |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         |   |          |       | NTabs                               | 31      | Farbcode FC |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         |   |          |       |                                     |         |             |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>35</b>   |          |       | <b>4 492 088 000</b>                |         |             |

| DATA SHEET   |          |         | BK13  |          |           | 559 611                              |         |          |
|--|----------|---------|---|----------|-----------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,55948 | Abbe Number   | Vd       | 61,15     | Dispersion                           | nF-nC   | 0,009150 |
|  | ne       | 1,56167 |   | Ve       | 60,90     |                                      | nF'-nC' | 0,009223 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,58187 | nF-nC   | 0,009150 | Pe (i,h)  | 0,7570                               |         |          |
| nh   | 404,66   | 1,57489 | nF'-nC'   | 0,009223 | Pe (h,g)  | 0,4446                               |         |          |
| ng   | 435,83   | 1,57079 |   |          | Pe (g,F') | 0,4803                               |         |          |
| nF'  | 479,99   | 1,56636 | <u>Deviation of Realative Partial Dispersions</u>   |          |           | Pe (F',e)                            | 0,5086  |          |
| n488,0   | 488,00   | 1,56569 | delta Pe (i,F')                                     | -0,0080  | Pe (e,d)  | 0,2370                               |         |          |
| ne   | 546,07   | 1,56167 | delta Pe (g,F')                                     | 0,0003   | Pe (d,C') | 0,2544                               |         |          |
| nd   | 587,56   | 1,55948 | delta Pe (F',e)                                     | 0,0004   | Pe (e,C') | 0,4914                               |         |          |
| n632,8   | 632,80   | 1,55755 | delta Pe (F',r)                                     | -0,0013  | Pe (C,r)  | 0,2220                               |         |          |
| nC'  | 643,85   | 1,55714 | <u>Chemical Properties</u>                          |          |           | Pe (r,s)                             | 0,3670  |          |
| n694,3   | 694,30   | 1,55545 | Water Resistance                                    | WRs      | A         | Pe (s,t)                             | 0,2860  |          |
| nr   | 706,52   | 1,55509 | Acide Resistance                                    | AR*      | 3         | <u>Internal Transmittance</u>        |         |          |
| ns   | 852,10   | 1,55171 |   |          |           |                                      | 10 mm   |          |
| nt   | 1 013,90 | 1,54907 |   |          |           | T 365                                | 0,910   |          |
| n1060,0  | 1 060,00 | 1,54843 |   |          |           | T 400                                | 0,977   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                                | 0,986   |          |
| Transformation Temperature, C                      | Tg       | 610     | Density, g/c.cm.                                    | SG       | 3,04      | T 550                                | 0,996   |          |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 68      | Grindability  | HG       | HG3       | T 640                                | 0,993   |          |
|  |          |         | Knoop Hardness                                      | KH       | -         | Ta                                   | 0,996   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,50      |                                      |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |           |                                      |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 50       |           | Bubble                               | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 20       |           | Farbcode                             | FC      | 35\33    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>33</b>   |          |           | <b>4 492 093 000</b>                 |         |          |

| DATA SHEET   |          |         | TK2   |          |        | 572 574                             |         |          |
|--|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,57249 | Abbe Number   | Vd       | 57,48  | Dispersion                          | nF-nC   | 0,009960 |
|  | ne       | 1,57486 |   | Ve       | 57,20  |                                     | nF'-nC' | 0,010050 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,59716 | nF-nC   | 0,009960 |        | Pe (i,h)                            | 0,7710  |          |
| nh   | 404,66   | 1,58941 | nF'-nC'   | 0,010050 |        | Pe (h,g)                            | 0,4514  |          |
| ng   | 435,83   | 1,58487 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,4852  |          |
| nF'  | 479,99   | 1,58000 | delta Pe (i,F')                                     | -0,0170  |        | Pe (F',e)                           | 0,5112  |          |
| n488,0   | 488,00   | 1,57926 | delta Pe (g,F')                                     | -0,0003  |        | Pe (e,d)                            | 0,2359  |          |
| ne   | 546,07   | 1,57486 | delta Pe (F',e)                                     | 0,0010   |        | Pe (d,C')                           | 0,2529  |          |
| nd   | 587,56   | 1,57249 | delta Pe (F',r)                                     | -0,0028  |        | Pe (e,C')                           | 0,4888  |          |
| n632,8   | 632,80   | 1,57040 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,2180  |          |
| nC'  | 643,85   | 1,56995 | Water Resistance                                    | WRs      | A      | Pe (r,s)                            | 0,3560  |          |
| n694,3   | 694,30   | 1,56814 | Acide Resistance                                    | AR*      | 3      | Pe (s,t)                            | 0,2710  |          |
| nr   | 706,52   | 1,56776 |   |          |        | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,56418 |   |          |        | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,56146 |   |          |        | T 365                               | 0,920   |          |
| n1060,0  | 1 060,00 | 1,56081 |   |          |        | T 400                               | 0,987   |          |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |        | T 440                               | 0,991   |          |
| Transformation Temperature, C                      | Tg       | 620     | Density, g/c.cm.                                    | SG       | 3,20   | T 550                               | 0,997   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 70      | Grindability  | HG       | HG3    | T 640                               | 0,995   |          |
|  |          |         | Knoop Hardness                                      | KH       | 456,00 | Ta                                  | 0,997   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,75   |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |        | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 11       |        | Bubble                              | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 27       |        | Farbcode                            | FC      | 34\32    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>38</b>   |          |        | <b>4 492 107 000</b>                |         |          |

| DATA SHEET   |          |         | TK4   |          |        | 611 558                             |         |          |           |        |
|--|----------|---------|---|----------|--------|-------------------------------------|---------|----------|-----------|--------|
| Refractive Index                                   | nd       | 1,61120 | Abbe Number   | Vd       | 55,82  | Dispersion                          | nF-nC   | 0,010950 |           |        |
|  | ne       | 1,61381 |   | Ve       | 55,53  |                                     | nF'-nC' | 0,011053 |           |        |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |           |        |
| ni   | 365,00   | 1,63843 | nF-nC   | 0,010950 |        | Pe (i,h)                            | 0,7740  |          |           |        |
| nh   | 404,66   | 1,62987 | nF'-nC'   | 0,011053 |        | Pe (h,g)                            | 0,4532  |          |           |        |
| ng   | 435,83   | 1,62486 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,4878  |          |           |        |
| nF'  | 479,99   | 1,61947 |   |          |        | delta Pe (i,F')                     | -0,0240 |          | Pe (F',e) | 0,5119 |
| n488,0   | 488,00   | 1,61866 | delta Pe (g,F')                                     | -0,0002  |        | Pe (e,d)                            | 0,2365  |          |           |        |
| ne   | 546,07   | 1,61381 | delta Pe (F',e)                                     | 0,0007   |        | Pe (d,C')                           | 0,2515  |          |           |        |
| nd   | 587,56   | 1,61120 | delta Pe (F',r)                                     | -0,0023  |        | Pe (e,C')                           | 0,4880  |          |           |        |
| n632,8   | 632,80   | 1,60891 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,2170  |          |           |        |
| nC'  | 643,85   | 1,60842 |   |          |        | Water Resistance                    | WRs     | A        | Pe (r,s)  | 0,3520 |
| n694,3   | 694,30   | 1,60644 | Acide Resistance                                    | AR*      | 4      | <u>Internal Transmittance</u>       |         |          |           |        |
| nr   | 706,52   | 1,60602 |   |          |        | 10 mm                               |         |          |           |        |
| ns   | 852,10   | 1,60213 |   |          |        | T 365                               |         |          | 0,841     |        |
| nt   | 1 013,90 | 1,59922 |   |          |        | T 400                               |         |          | 0,966     |        |
| n1060,0  | 1 060,00 | 1,59853 |   |          |        | T 440                               |         |          | 0,987     |        |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |        | T 550                               |         |          | 0,997     |        |
| Transformation Temperature, C                      | Tg       | 655     | Density, g/c.cm.                                    | SG       | 3,58   | T 640                               |         |          | 0,994     |        |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 66      | Grindability  | HG       | HG3    | Ta                                  |         |          | 0,997     |        |
|  |          |         | Knoop Hardness                                      | KH       | 442,00 |                                     |         |          |           |        |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,25   |                                     |         |          |           |        |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |        | <u>Other Properties</u>             |         |          |           |        |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 19       |        | Bubble                              |         |          | B 4       |        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 34       |        | Farbcode                            |         |          | FC 36\34  |        |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>56</b>   |          |        | <b>4 492 109 000</b>                |         |          |           |        |

| DATA SHEET   |          |         | TK8   |          |           | 614 551                              |         |          |  |
|--|----------|---------|---|----------|-----------|--------------------------------------|---------|----------|--|
| Refractive Index                                   | nd       | 1,61410 | Abbe Number   | Vd       | 55,13     | Dispersion                           | nF-nC   | 0,011140 |  |
|  | ne       | 1,61675 |   | Ve       | 54,84     |                                      | nF'-nC' | 0,011247 |  |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Realative Partial Dispersions</u> |         |          |  |
| ni   | 365,00   | 1,64189 | nF-nC   | 0,011140 | Pe (i,h)  | 0,7790                               |         |          |  |
| nh   | 404,66   | 1,63313 | nF'-nC'   | 0,011247 | Pe (h,g)  | 0,4560                               |         |          |  |
| ng   | 435,83   | 1,62800 | <u>Deviation of Realative Partial Dispersions</u>   |          |           | Pe (g,F')                            | 0,4876  |          |  |
| nF'  | 479,99   | 1,62252 | delta Pe (i,F')                                     | -0,0240  | Pe (F',e) | 0,5125                               |         |          |  |
| n488,0   | 488,00   | 1,62169 | delta Pe (g,F')                                     | -0,0014  | Pe (e,d)  | 0,2360                               |         |          |  |
| ne   | 546,07   | 1,61675 | delta Pe (F',e)                                     | 0,0009   | Pe (d,C') | 0,2515                               |         |          |  |
| nd   | 587,56   | 1,61410 | delta Pe (F',r)                                     | -0,0027  | Pe (e,C') | 0,4875                               |         |          |  |
| n632,8   | 632,80   | 1,61177 | <u>Chemical Properties</u>                          |          |           | Pe (C,r)                             | 0,2160  |          |  |
| nC'  | 643,85   | 1,61127 | Water Resistance                                    | WRs      | A         | Pe (r,s)                             | 0,3490  |          |  |
| n694,3   | 694,30   | 1,60927 | Acide Resistance                                    | AR*      | 4         | Pe (s,t)                             | 0,2610  |          |  |
| nr   | 706,52   | 1,60884 |   |          |           | <u>Internal Transmittance</u>        |         |          |  |
| ns   | 852,10   | 1,60491 |   |          |           | 10 mm                                |         |          |  |
| nt   | 1 013,90 | 1,60198 |   |          |           | T 365                                | 0,810   |          |  |
| n1060,0  | 1 060,00 | 1,60130 |   |          |           | T 400                                | 0,956   |          |  |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                                | 0,985   |          |  |
| Transformation Temperature, C                      | Tg       | 635     | Density, g/c.cm.                                    | SG       | 3,61      | T 550                                | 0,996   |          |  |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 70      | Grindability  | HG       | HG3       | T 640                                | 0,994   |          |  |
|  |          |         | Knoop Hardness                                      | KH       | 431,00    | Ta                                   | 0,996   |          |  |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,05      |                                      |         |          |  |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |           | <u>Other Properties</u>              |         |          |  |
| Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    | 14      |   |          |           | Bubble                               | B       | 4        |  |
| Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    | 26      |   |          |           | Farbcode                             | FC      | 36\34    |  |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>63</b>   |          |           | <b>4 492 111 000</b>                 |         |          |  |

| DATA SHEET                                    |          |         | TK9  |          |       | 617 540                             |         |          |
|---|----------|---------|--|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                              | nd       | 1,61720 | Abbe Number  | Vd       | 54,05 | Dispersion                          | nF-nC   | 0,011420 |
|   | ne       | 1,61993 |  | Ve       | 53,76 |                                     | nF'-nC' | 0,011531 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,64583 | nF-nC  | 0,011420 |       | Pe (i,h)                            | 0,7870  |          |
| nh  | 404,66   | 1,63675 | nF'-nC'  | 0,011531 |       | Pe (h,g)                            | 0,4568  |          |
| ng  | 435,83   | 1,63148 | <u>Deviation of Relative Partial Dispersions</u>       |          |       | Pe (g,F')                           | 0,4895  |          |
| nF'   | 479,99   | 1,62584 | delta Pe (i,F')  | -0,0230  |       | Pe (F',e)                           | 0,5127  |          |
| n488,0  | 488,00   | 1,62499 | delta Pe (g,F')  | -0,0011  |       | Pe (e,d)                            | 0,2362  |          |
| ne  | 546,07   | 1,61993 | delta Pe (F',e)  | 0,0005   |       | Pe (d,C')                           | 0,2511  |          |
| nd  | 587,56   | 1,61720 | delta Pe (F',r)  | -0,0023  |       | Pe (e,C')                           | 0,4873  |          |
| n632,8  | 632,80   | 1,61482 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                            | 0,2160  |          |
| nC'   | 643,85   | 1,61431 | Water Resistance                                       | WRs      | A     | Pe (r,s)                            | 0,3490  |          |
| n694,3  | 694,30   | 1,61226 | Acide Resistance                                       | AR*      | 5     | Pe (s,t)                            | 0,2580  |          |
| nr  | 706,52   | 1,61182 | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,60780 | Density, g\c.cm.                                       | SG       | 3,62  | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,60482 | Grindability   | HG       | HG3   | T 365                               | 0,824   |          |
| n1060,0                                       | 1 060,00 | 1,60412 | Knoop Hardness   | KH       | -     | T 400                               | 0,957   |          |
| <u>Termal Properties</u>                      |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 2,35  | T 440                               | 0,981   |          |
| Transformation<br>Temperature, C              | Tg       | 580     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550                               | 0,996   |          |
| Expansion<br>Coefficient, 10 <sup>-7</sup> /C | Alpha    | 75      | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | 12    | T 640                               | 0,993   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 26    | Ta                                  | 0,996   |          |
|   |          |         |  |          |       | <u>Other Properties</u>             |         |          |
|   |          |         |  |          |       | Bubble                              | B       | 4        |
|   |          |         |  |          |       | Farbcode                            | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>65</b>  |          |       | <b>4 492 113 000</b>                |         |          |

| DATA SHEET   |          |         | TK12   |          |        | 568 629                             |         |                   |
|--|----------|---------|--|----------|--------|-------------------------------------|---------|-------------------|
| Refractive Index                                   | nd       | 1,56888 | Abbe Number  | Vd       | 62,93  | Dispersion                          | nF-nC   | 0,009040          |
|  | ne       | 1,57104 |  | Ve       | 62,71  |                                     | nF'-nC' | 0,009106          |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                             |          |        | <u>Relative Partial Dispersions</u> |         |                   |
| ni   | 365,00   | 1,59084 | nF-nC  | 0,009040 |        | Pe (i,h)                            | 0,7490  |                   |
| nh   | 404,66   | 1,58402 | nF'-nC'  | 0,009106 |        | Pe (h,g)                            | 0,4413  |                   |
| ng   | 435,83   | 1,58000 | <u>Deviation of Relative Partial Dispersions</u>       |          |        | Pe (g,F')                           | 0,4766  |                   |
| nF'  | 479,99   | 1,57566 |  |          |        | delta Pe (i,F')                     | -0,0060 |                   |
| n488,0   | 488,00   | 1,57499 | delta Pe (g,F')  | -0,0007  |        | Pe (e,d)                            | 0,2370  |                   |
| ne   | 546,07   | 1,57104 | delta Pe (F',e)  | 0,0004   |        | Pe (d,C')                           | 0,2554  |                   |
| nd   | 587,56   | 1,56888 | delta Pe (F',r)  | -0,0010  |        | Pe (e,C')                           | 0,4924  |                   |
| n632,8   | 632,80   | 1,56697 | <u>Chemical Properties</u>                             |          |        | Pe (C,r)                            | 0,2230  |                   |
| nC'  | 643,85   | 1,56656 |  |          |        | Water Resistance                    | WRs     | A                 |
| n694,3   | 694,30   | 1,56488 | Acide Resistance                                       | AR*      | 4      | <u>Internal Transmittance</u>       |         |                   |
| nr   | 706,52   | 1,56452 | <u>Mechanical Properties</u>                           |          |        | 10 mm                               |         |                   |
| ns   | 852,10   | 1,56110 |  |          |        | Density, g/c.cm.                    | SG      | 3,06              |
| nt   | 1 013,90 | 1,55838 | Grindability   | HG       | HG3    | T 400                               | 0,985   |                   |
| n1060,0  | 1 060,00 | 1,55771 | Knoop Hardness   | KH       | 491,00 | T 440                               | 0,989   |                   |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient, nm/lcm 10 <sup>^</sup> -5 Pa | K        | 2,40   | T 550                               | 0,996   |                   |
| Transformation Temperature, C                      | Tg       | 605     | <u>Temperature Coefficient of Refractive Index</u>     |          |        | T 640                               | 0,995   |                   |
| Exspansion Coefficient, 10 <sup>^</sup> -7/C       | Alpha    | 65      |  |          |        | NTabs                               | 6       | Ta                |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                                |          |        | Bubble B 4                          |         |                   |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         |  |          |        | NTabs                               | 20      | Farbcode FC 35\33 |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         |  |          |        |                                     |         |                   |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>36</b>  |          |        | <b>4 492 115 000</b>                |         |                   |

| DATA SHEET                                    |          |         | TK13   |          |           | 603 606                             |         |          |  |
|---|----------|---------|--|----------|-----------|-------------------------------------|---------|----------|--|
| Refractive Index                              | nd       | 1,60389 | Abbe Number  | Vd       | 60,63     | Dispersion                          | nF-nC   | 0,009960 |  |
|   | ne       | 1,60626 |  | Ve       | 60,38     |                                     | nF'-nC' | 0,010040 |  |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |           | <u>Relative Partial Dispersions</u> |         |          |  |
| ni  | 365,00   | 1,62829 | nF-nC  | 0,009960 | Pe (i,h)  | 0,7580                              |         |          |  |
| nh  | 404,66   | 1,62068 | nF'-nC'  | 0,010040 | Pe (h,g)  | 0,4451                              |         |          |  |
| ng  | 435,83   | 1,61621 | <u>Deviation of Relative Partial Dispersions</u>       |          |           | Pe (g,F')                           | 0,4816  |          |  |
| nF'   | 479,99   | 1,61138 | delta Pe (i,F')  | -0,0100  | Pe (F',e) | 0,5093                              |         |          |  |
| n488,0  | 488,00   | 1,61064 | delta Pe (g,F')  | 0,0008   | Pe (e,d)  | 0,2363                              |         |          |  |
| ne  | 546,07   | 1,60626 | delta Pe (F',e)  | 0,0008   | Pe (d,C') | 0,2544                              |         |          |  |
| nd  | 587,56   | 1,60389 | delta Pe (F',r)  | -0,0011  | Pe (e,C') | 0,4907                              |         |          |  |
| n632,8  | 632,80   | 1,60179 | <u>Chemical Properties</u>                             |          |           | Pe (C,r)                            | 0,2220  |          |  |
| nC'   | 643,85   | 1,60134 | Water Resistance                                       | WRs      | A         | Pe (r,s)                            | 0,3670  |          |  |
| n694,3  | 694,30   | 1,59951 | Acide Resistance                                       | AR*      | 4         | Pe (s,t)                            | 0,2860  |          |  |
| nr  | 706,52   | 1,59911 | <u>Mechanical Properties</u>                           |          |           | <u>Internal Transmittance</u>       |         |          |  |
| ns  | 852,10   | 1,59543 | Density, g/c.cm.                                       | SG       | 3,44      | 10 mm                               |         |          |  |
| nt  | 1 013,90 | 1,59256 | Grindability   | HG       | HG3       | T 365                               | 0,810   |          |  |
| n1060,0                                       | 1 060,00 | 1,59186 | Knoop Hardness   | KH       | 488,00    | T 400                               | 0,974   |          |  |
| <u>Thermal Properties</u>                     |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 2,00      | T 440                               | 0,988   |          |  |
| Transformation<br>Temperature, C              | Tg       | 640     | <u>Temperature Coefficient of Refractive Index</u>     |          |           | T 550                               | 0,995   |          |  |
| Expansion Coefficient,<br>10 <sup>-7</sup> /C | Alpha    | 67      | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | 3         | T 640                               | 0,994   |          |  |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 18        | Ta                                  | 0,995   |          |  |
|   |          |         |  |          |           | <u>Other Properties</u>             |         |          |  |
|   |          |         |  |          |           | Bubble                              | B       | 4        |  |
|   |          |         |  |          |           | Farbcode                            | FC      | 36\34    |  |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>53</b>  |          |           | <b>4 492 117 000</b>                |         |          |  |



| DATA SHEET   |          |         | TK14  |          |        | 613 605                                       |         |          |
|--|----------|---------|---|----------|--------|---|---------|----------|
| Refractive Index                                   | nd       | 1,61309 | Abbe Number   | Vd       | 60,58  | Dispersion                                    | nF-nC   | 0,010120 |
|  | ne       | 1,61551 |   | Ve       | 60,33  |   | nF'-nC' | 0,010203 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u>           |         |          |
| ni   | 365,00   | 1,63791 | nF-nC   | 0,010120 |        | Pe (i,h)                                      | 0,7600  |          |
| nh   | 404,66   | 1,63016 | nF'-nC'   | 0,010203 |        | Pe (h,g)                                      | 0,4463  |          |
| ng   | 435,83   | 1,62561 | <u>Deviation of Realative Partial Dispersions</u>   |          |        | Pe (g,F')                                     | 0,4806  |          |
| nF'  | 479,99   | 1,62070 |   |          |        | delta Pe (i,F')                               | -0,0090 |          |
| n488,0   | 488,00   | 1,61996 | delta Pe (g,F')                                     | -0,0002  |        | Pe (e,d)                                      | 0,2367  |          |
| ne   | 546,07   | 1,61551 | delta Pe (F',e)                                     | 0,0008   |        | Pe (d,C')                                     | 0,2541  |          |
| nd   | 587,56   | 1,61309 | delta Pe (F',r)                                     | -0,0023  |        | Pe (e,C')                                     | 0,4907  |          |
| n632,8   | 632,80   | 1,61096 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                                      | 0,2200  |          |
| nC'  | 643,85   | 1,61050 |   |          |        | Water Resistance                              | WRs     | A        |
| n694,3   | 694,30   | 1,60864 | Acide Resistance                                    | AR*      | 5      | Pe (s,t)                                      | 0,2840  |          |
| nr   | 706,52   | 1,60825 | <u>Mechanical Properties</u>                        |          |        | <u>Internal Transmittance</u>                 |         |          |
| ns   | 852,10   | 1,60451 |   |          |        | Density, g/c.cm.                              | SG      | 3,51     |
| nt   | 1 013,90 | 1,60161 | Grindability  | HG       | HG3    | T 365   | 0,842   |          |
| n1060,0  | 1 060,00 | 1,60090 | Knoop Hardness                                      | KH       | 464,00 | T 400   | 0,964   |          |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,85   | T 440   | 0,983   |          |
| Transformation Temperature, C                      | Tg       | 640     | <u>Temperature Coefficient of Refractive Index</u>  |          |        | T 550   | 0,995   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 69      |   |          |        | Range of Temperature, C: - 60 ... 20, C'-Line | NTabs   | -3       |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 9      | Ta  | 0,995   |          |
| <u>Other Properties</u>                            |          |         |   |          |        | Bubble  | B       | 4        |
|  |          |         |   |          |        | Farbcode                                      | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>61</b>   |          |        | <b>4 492 121 000</b>                          |         |          |

| DATA SHEET   |          |         | TK16  |          |        | 612 583                             |         |          |
|--|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,61269 | Abbe Number   | Vd       | 58,35  | Dispersion                          | nF-nC   | 0,010500 |
|  | ne       | 1,61519 |   | Ve       | 58,08  |                                     | nF'-nC' | 0,010592 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,63862 | nF-nC   | 0,010500 |        | Pe (i,h)                            | 0,7680  |          |
| nh   | 404,66   | 1,63049 | nF'-nC'   | 0,010592 |        | Pe (h,g)                            | 0,4490  |          |
| ng   | 435,83   | 1,62573 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,4849  |          |
| nF'  | 479,99   | 1,62060 |   |          |        | delta Pe (i,F')                     | -0,0150 |          |
| n488,0   | 488,00   | 1,61983 | delta Pe (g,F')                                     | 0,0007   |        | Pe (e,d)                            | 0,2358  |          |
| ne   | 546,07   | 1,61519 | delta Pe (F',e)                                     | 0,0007   |        | Pe (d,C')                           | 0,2537  |          |
| nd   | 587,56   | 1,61269 | delta Pe (F',r)                                     | -0,0024  |        | Pe (e,C')                           | 0,4895  |          |
| n632,8   | 632,80   | 1,61048 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,2190  |          |
| nC'  | 643,85   | 1,61001 |   |          |        | Water Resistance                    | WRs     | A        |
| n694,3   | 694,30   | 1,60810 | Acide Resistance                                    | AR*      | 4      | <u>Internal Transmittance</u>       |         |          |
| nr   | 706,52   | 1,60769 |   |          |        | 10 mm                               |         |          |
| ns   | 852,10   | 1,60389 |   |          |        | T 365                               | 0,805   |          |
| nt   | 1 013,90 | 1,60101 | T 400   | 0,964    |        |                                     |         |          |
| n1060,0  | 1 060,00 | 1,60032 | T 440   | 0,983    |        |                                     |         |          |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |        | T 550                               | 0,996   |          |
|  |          |         |   |          |        | T 640                               | 0,993   |          |
| Transformation Temperature, C                      | Tg       | 630     | Density, g\c.cm.                                    | SG       | 3,56   | Ta                                  | 0,996   |          |
| Expsansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 73      | Grindability  | HG       | HG3    |                                     |         |          |
|  |          |         | Knoop Hardness                                      | KH       | 473,00 |                                     |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,85   |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |        | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | -2       |        | Bubble                              | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 13       |        | Farbcode                            | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>59</b>   |          |        | <b>4 492 119 000</b>                |         |          |

| DATA SHEET                                 |          |         | TK17  |          |        | 628 593                             |         |          |
|--|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                           | nd       | 1,62800 | Abbe Number   | Vd       | 59,36  | Dispersion                          | nF-nC   | 0,010580 |
|  | ne       | 1,63051 |   | Ve       | 59,09  |                                     | nF'-nC' | 0,010670 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,65401 | nF-nC   | 0,010580 |        | Pe (i,h)                            | 0,7630  |          |
| nh   | 404,66   | 1,64587 | nF'-nC'   | 0,010670 |        | Pe (h,g)                            | 0,4470  |          |
| ng   | 435,83   | 1,64110 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,4824  |          |
| nF'  | 479,99   | 1,63595 | delta Pe (i,F')                                     | -0,0140  |        | Pe (F',e)                           | 0,5099  |          |
| n488,0                                     | 488,00   | 1,63517 | delta Pe (g,F')                                     | -0,0003  |        | Pe (e,d)                            | 0,2360  |          |
| ne   | 546,07   | 1,63051 | delta Pe (F',e)                                     | 0,0007   |        | Pe (d,C')                           | 0,2541  |          |
| nd   | 587,56   | 1,62800 | delta Pe (F',r)                                     | -0,0022  |        | Pe (e,C')                           | 0,4901  |          |
| n632,8                                     | 632,80   | 1,62576 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,2200  |          |
| nC'  | 643,85   | 1,62528 | Water Resistance                                    | WRs      | A      | Pe (r,s)                            | 0,3630  |          |
| n694,3                                     | 694,30   | 1,62335 | Acide Resistance                                    | AR*      | 6      | Pe (s,t)                            | 0,2790  |          |
| nr   | 706,52   | 1,62294 | <u>Mechanical Properties</u>                        |          |        | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,61907 | Density, g/c.cm.                                    | SG       | 3,66   | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,61609 | Grindability  | HG       | HG3    | T 365                               | 0,877   |          |
| n1060,0                                    | 1 060,00 | 1,61538 | Knoop Hardness                                      | KH       | 455,00 | T 400                               | 0,966   |          |
| <u>Termal Properties</u>                   |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,80   | T 440                               | 0,986   |          |
| Transformation Temperature, C              | Tg       | 625     | <u>Temperature Coefficient of Refractive Index</u>  |          |        | T 550                               | 0,997   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 75      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | -13    | T 640                               | 0,994   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 3      | Ta                                  | 0,997   |          |
|  |          |         |   |          |        | <u>Other Properties</u>             |         |          |
|  |          |         |   |          |        | Bubble                              | B       | 4        |
|  |          |         |   |          |        | Farbcode                            | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>73</b>   |          |        | <b>4 492 124 000</b>                |         |          |

| DATA SHEET   |          |          | TK20  |          |           | 622 567                             |         |          |  |
|--|----------|----------|---|----------|-----------|-------------------------------------|---------|----------|--|
| Refractive Index                                   | nd       | 1,62210  | Abbe Number   | Vd       | 56,71     | Dispersion                          | nF-nC   | 0,010970 |  |
|  | ne       | 1,62470  |   | Ve       | 56,43     |                                     | nF'-nC' | 0,011071 |  |
| <u>Refractive Indices</u>                          |          |          | <u>Partial Dispersions</u>                          |          |           | <u>Relative Partial Dispersions</u> |         |          |  |
| ni   | 365,00   | 1,64930  | nF-nC   | 0,010970 | Pe (i,h)  | 0,7730                              |         |          |  |
| nh   | 404,66   | 1,64074  | nF'-nC'   | 0,011071 | Pe (h,g)  | 0,4511                              |         |          |  |
| ng   | 435,83   | 1,63575  | <u>Deviation of Relative Partial Dispersions</u>    |          |           | Pe (g,F')                           | 0,4858  |          |  |
| nF'  | 479,99   | 1,63037  | delta Pe (i,F')                                     | -0,0220  | Pe (F',e) | 0,5117                              |         |          |  |
| n488,0   | 488,00   | 1,62955  | delta Pe (g,F')                                     | -0,0008  | Pe (e,d)  | 0,2353                              |         |          |  |
| ne   | 546,07   | 1,62470  | delta Pe (F',e)                                     | 0,0010   | Pe (d,C') | 0,2530                              |         |          |  |
| nd   | 587,56   | 1,62210  | delta Pe (F',r)                                     | -0,0026  | Pe (e,C') | 0,4883                              |         |          |  |
| n632,8   | 632,80   | 1,61979  | <u>Chemical Properties</u>                          |          |           | Pe (C,r)                            | 0,2170  |          |  |
| nC'  | 643,85   | 1,61930  | Water Resistance                                    | WRs      | A         | Pe (r,s)                            | 0,3540  |          |  |
| n694,3   | 694,30   | 1,61732  | Acide Resistance                                    | AR*      | 5         | Pe (s,t)                            | 0,2660  |          |  |
| nr   | 706,52   | 1,61689  |   |          |           | <u>Internal Transmittance</u>       |         |          |  |
| ns   | 852,10   | 1,61297  |   |          |           | 10 mm                               |         |          |  |
| nt   | 1 013,90 | 16,10020 |   |          |           | T 365                               | 0,816   |          |  |
| n1060,0  | 1 060,00 | 1,60932  |   |          |           | T 400                               | 0,968   |          |  |
| <u>Termal Properties</u>                           |          |          | <u>Mechanical Properties</u>                        |          |           | T 440                               | 0,989   |          |  |
| Transformation Temperature, C                      | Tg       | 650      | Density, g/cm.                                      | SG       | 3,58      | T 550                               | 0,996   |          |  |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 73       | Grindability  | HG       | HG3       | T 640                               | 0,994   |          |  |
|  |          |          | Knoop Hardness                                      | KH       | 449,00    | Ta                                  | 0,996   |          |  |
|  |          |          | Photoelastic Coefficient, nm/cm 10 <sup>-5</sup> Pa | K        | 1,90      |                                     |         |          |  |
| <u>Temperature Coefficient of Refractive Index</u> |          |          |   |          |           | <u>Other Properties</u>             |         |          |  |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |          | NTabs   | 0        |           | Bubble                              | B       | 4        |  |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |          | NTabs   | 12       |           | Farbcode                            | FC      | 36\34    |  |
| <b>PG&amp;F, TM (UA)</b>                           |          |          | <b>68</b>   |          |           | <b>4 492 125 000</b>                |         |          |  |

| DATA SHEET   |          |         | TK21  |          |        | 656 511                             |         |          |
|--|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,65691 | Abbe Number   | Vd       | 51,12  | Dispersion                          | nF-nC   | 0,012850 |
|  | ne       | 1,65996 |   | Ve       | 50,82  |                                     | nF'-nC' | 0,012986 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,68949 | nF-nC   | 0,012850 |        | Pe (i,h)                            | 0,8020  |          |
| nh   | 404,66   | 1,67908 | nF'-nC'   | 0,012986 |        | Pe (h,g)                            | 0,4633  |          |
| ng   | 435,83   | 1,67306 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,4937  |          |
| nF'  | 479,99   | 1,66665 | delta Pe (i,F')                                     | -0,0250  |        | Pe (F',e)                           | 0,5153  |          |
| n488,0   | 488,00   | 1,66569 | delta Pe (g,F')                                     | -0,0013  |        | Pe (e,d)                            | 0,2346  |          |
| ne   | 546,07   | 1,65996 | delta Pe (F',e)                                     | 0,0014   |        | Pe (d,C')                           | 0,2501  |          |
| nd   | 587,56   | 1,65691 | delta Pe (F',r)                                     | -0,0028  |        | Pe (e,C')                           | 0,4847  |          |
| n632,8   | 632,80   | 1,65424 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,2130  |          |
| nC'  | 643,85   | 1,65367 | Water Resistance                                    | WRs      | A      | Pe (r,s)                            | 0,3400  |          |
| n694,3   | 694,30   | 1,65139 | Acide Resistance                                    | AR*      | 4      | Pe (s,t)                            | 0,2480  |          |
| nr   | 706,52   | 1,65090 | <u>Internal Transmittance</u>                       |          |        | 10 mm                               |         |          |
| ns   | 852,10   | 1,64648 | T 365   |          |        | 0,818                               |         |          |
| nt   | 1 013,90 | 1,64326 | T 400   |          |        | 0,950                               |         |          |
| n1060,0  | 1 060,00 | 1,64251 | T 440   |          |        | 0,978                               |         |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |        | T 550                               |         |          |
| Transformation Temperature, C                      | Tg       | 630     | Density, g\c.cm.                                    | SG       | 3,98   | T 640                               |         |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 80      | Grindability  | HG       | HG2    | 0,994                               |         |          |
|  |          |         | Knoop Hardness                                      | KH       | 406,00 | Ta                                  |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,95   | 0,996                               |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |        | Bubble                              |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 8        |        | Farbcode                            |         |          |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 21       |        | FC 36\35                            |         |          |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>82</b>   |          |        | <b>4 492 127 000</b>                |         |          |

| DATA SHEET   |          |         | TK23  |          |          | 589 612                                    |         |          |           |
|--|----------|---------|---|----------|----------|--|---------|----------|-----------|
| Refractive Index                                   | nd       | 1,58919 | Abbe Number                                       | Vd       | 61,25    | Dispersion                                 | nF-nC   | 0,009620 |           |
|  | ne       | 1,59147 |   | Ve       | 61,01    |  | nF'-nC' | 0,009695 |           |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                        |          |          | <u>Realative Partial Dispersions</u>       |         |          |           |
| ni   | 365,00   | 1,61262 | nF-nC   | 0,009620 |          | Pe (i,h)                                   | 0,7530  |          |           |
| nh   | 404,66   | 1,60532 | nF'-nC'   | 0,009695 |          | Pe (h,g)                                   | 0,4413  |          |           |
| ng   | 435,83   | 1,60104 | <u>Deviation of Realative Partial Dispersions</u> |          |          | Pe (g,F')                                  | 0,4782  |          |           |
| nF'  | 479,99   | 1,59641 |   |          |          | delta Pe (i,F')                            | -0,0160 |          | Pe (F',e) |
| n488,0   | 488,00   | 1,59570 | delta Pe (g,F')                                   | -0,0017  |          | Pe (e,d)                                   | 0,2355  |          |           |
| ne   | 546,07   | 1,59147 | delta Pe (F',e)                                   | 0,0010   |          | Pe (d,C')                                  | 0,2555  |          |           |
| nd   | 587,56   | 1,58919 | delta Pe (F',r)                                   | -0,0024  |          | Pe (e,C')                                  | 0,4910  |          |           |
| n632,8   | 632,80   | 1,58715 | <u>Chemical Properties</u>                        |          |          | Pe (C,r)                                   | 0,2210  |          |           |
| nC'  | 643,85   | 1,58671 |   |          |          | Water Resistance                           | WRs     | A        | Pe (r,s)  |
| n694,3   | 694,30   | 1,58495 | Acide Resistance                                  | AR*      | 5        | <u>Internal Transmittance</u>              |         |          |           |
| nr   | 706,52   | 1,58457 | <u>Mechanical Properties</u>                      |          |          | 10 mm                                      |         |          |           |
| ns   | 852,10   | 1,58100 |   |          |          | Density, g/c.cm.                           | SG      | 3,24     | T 365     |
| nt   | 1 013,90 | 1,57821 | Grindability                                      | HG       | HG3      | T 400                                      | 0,960   |          |           |
| n1060,0  | 1 060,00 | 1,57753 | Knoop Hardness                                    | KH       | 486,00   | T 440                                      | 0,986   |          |           |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient, nm\cm                   | K        | 2,30     | T 550                                      | 0,995   |          |           |
|  |          |         | Transformation Temperature, C                     | Tg       | 645      | 10 <sup>-5</sup> Pa                        |         | T 640    | 0,994     |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                           |          |          | 10 mm                                      |         |          |           |
|  |          |         |   |          |          | Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha   | 59       | Bubble    |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 14       | Farbcode |  |         | FC       | 36\34     |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 30       |          |  |         |          |           |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>48</b>   |          |          | <b>4 492 129 000</b>                       |         |          |           |

| DATA SHEET                                     |          |         | TFK11   |          |       | 601 661                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                               | nd       | 1,60158 | Abbe Number   | Vd       | 66,11 | Dispersion                          | nF-nC   | 0,009100 |
|  | ne       | 0,60375 |   | Ve       | 65,86 |                                     | nF'-nC' | 0,009167 |
| <u>Refractive Indices</u>                      |          |         | <u>Partial Dispersions</u>                              |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | -       | nF-nC   | 0,009100 |       | Pe (i,h)                            | -       |          |
| nh   | 404,66   | 1,61684 | nF'-nC'   | 0,009167 |       | Pe (h,g)                            | 0,4407  |          |
| ng   | 435,83   | 1,61280 | <u>Deviation of Relative Partial Dispersions</u>        |          |       | Pe (g,F')                           | 0,4789  |          |
| nF'  | 479,99   | 1,60841 | delta Pe (i,F')   | -        |       | Pe (F',e)                           | 0,5084  |          |
| n488,0   | 488,00   | 1,60774 | delta Pe (g,F')   | 0,0062   |       | Pe (e,d)                            | 0,2367  |          |
| ne   | 546,07   | 0,60375 | delta Pe (F',e)   | 0,0031   |       | Pe (d,C')                           | 0,2553  |          |
| nd   | 587,56   | 1,60158 | delta Pe (F',r)   | -0,0037  |       | Pe (e,C')                           | 0,4920  |          |
| n632,8   | 632,80   | 1,59966 | <u>Chemical Properties</u>                              |          |       | Pe (C,r)                            | 0,2230  |          |
| nC'  | 643,85   | 1,59924 | Water Resistance  | WRs      | SG    | Pe (r,s)                            | 0,3710  |          |
| n694,3   | 694,30   | 1,59756 | Acide Resistance  | AR*      | 6     | Pe (s,t)                            | 0,2890  |          |
| nr   | 706,52   | 1,59720 | <u>Mechanical Properties</u>                            |          |       | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,59380 | Density, g/c.cm.  | SG       | 3,50  | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,59115 | Grindability  | HG       | HG2   | T 365                               | 0,832   |          |
| n1060,0  | 1 060,00 | 1,59051 | Knoop Hardness  | KH       | -     | T 400                               | 0,977   |          |
| <u>Thermal Properties</u>                      |          |         | Photoelastic Coefficient,<br>nm/lcm 10 <sup>-5</sup> Pa | K        | 1,10  | T 440                               | 0,986   |          |
| Transformation<br>Temperature, C               | Tg       | 595     | <u>Temperature Coefficient of Refractive Index</u>      |          |       | T 550                               | 0,995   |          |
| Exspansion<br>Coefficient, 10 <sup>-7</sup> /C | Alpha    | 100     | Range of Temperature, C: - 60 ... 20, C'-Line           | NTabs    | -56   | T 640                               | -       |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line            | NTabs    | -48   | Ta                                  | 0,995   |          |
|  |          |         |   |          |       | <u>Other Properties</u>             |         |          |
|  |          |         |   |          |       | Bubble                              | B       | 4        |
|  |          |         |   |          |       | Farbcode                            | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                       |          |         | <b>51</b>   |          |       | <b>4 492 041 000</b>                |         |          |

| DATA SHEET                                  |          |         | CTK3  |          |        | 659 573                             |         |          |
|---|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                            | nd       | 1,65950 | Abbe Number   | Vd       | 57,35  | Dispersion                          | nF-nC   | 0,011500 |
|   | ne       | 1,66224 |   | Ve       | 57,09  |                                     | nF'-nC' | 0,011600 |
| <u>Refractive Indices</u>                   |          |         | <u>Partial Dispersions</u>                            |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,68789 | nF-nC   | 0,011500 |        | Pe (i,h)                            | 0,7700  |          |
| nh  | 404,66   | 1,67896 | nF'-nC'   | 0,011600 |        | Pe (h,g)                            | 0,4477  |          |
| ng  | 435,83   | 1,67377 | <u>Deviation of Relative Partial Dispersions</u>      |          |        | Pe (g,F')                           | 0,4834  |          |
| nF'   | 479,99   | 1,66816 | delta Pe (i,F')                                       | -0,0240  |        | Pe (F',e)                           | 0,5105  |          |
| n488,0                                      | 488,00   | 1,66731 | delta Pe (g,F')                                       |          |        | Pe (e,d)                            | 0,2358  |          |
| ne  | 546,07   | 1,66224 | delta Pe (F',e)                                       | 0,0002   |        | Pe (d,C')                           | 0,2535  |          |
| nd  | 587,56   | 1,65950 | delta Pe (F',r)                                       | -0,0023  |        | Pe (e,C')                           | 0,4893  |          |
| n632,8                                      | 632,80   | 1,65708 | <u>Chemical Properties</u>                            |          |        | Pe (C,r)                            | 0,2180  |          |
| nC'   | 643,85   | 1,65656 | Water Resistance                                      | WRs      | A      | Pe (r,s)                            | 0,3590  |          |
| n694,3                                      | 694,30   | 1,65447 | Acide Resistance                                      | AR*      | 5      | Pe (s,t)                            | 0,2730  |          |
| nr  | 706,52   | 1,65403 | <u>Mechanical Properties</u>                          |          |        | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,64987 | Density, g/c.cm.                                      | SG       | 3,91   | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,64670 | Grindability  | HG       | HG3    | T 365                               | 0,914   |          |
| n1060,0                                     | 1 060,00 | 1,64594 | Knoop Hardness  | KH       | 476,00 | T 400                               | 0,967   |          |
| <u>Termal Properties</u>                    |          |         | Photoelastic Coefficient, nm\cm 10 <sup>^</sup> -5 Pa | K        | 1,55   | T 440                               | 0,980   |          |
| Transformation Temperature, C               | Tg       | 640     | <u>Temperature Coefficient of Refractive Index</u>    |          |        | T 550                               | 0,996   |          |
| Expansion Coefficient, 10 <sup>^</sup> -7/C | Alpha    | 80      | Range of Temperature, C: - 60 ... 20, C'-Line         | NTabs    | -18    | T 640                               | 0,996   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line          | NTabs    | 5      | Ta                                  | 0,996   |          |
|   |          |         |   |          |        | <u>Other Properties</u>             |         |          |
|   |          |         |   |          |        | Bubble                              | B       | 4        |
|   |          |         |   |          |        | Farbcode                            | FC      | 36\33    |
| <b>PG&amp;F, TM (UA)</b>                    |          |         | <b>83</b>   |          |        | <b>4 492 166 000</b>                |         |          |



| DATA SHEET   |          |         | CTK7  |          |           | 687 535                             |         |          |  |
|--|----------|---------|---|----------|-----------|-------------------------------------|---------|----------|--|
| Refractive Index                                   | nd       | 1,68701 | Abbe Number   | Vd       | 53,59     | Dispersion                          | nF-nC   | 0,012820 |  |
|  | ne       | 1,69006 |   | Ve       | 53,31     |                                     | nF'-nC' | 0,012944 |  |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Relative Partial Dispersions</u> |         |          |  |
| ni   | 365,00   | 1,71900 | nF-nC   | 0,012820 | Pe (i,h)  | 0,7800                              |         |          |  |
| nh   | 404,66   | 1,70890 | nF'-nC'   | 0,012944 | Pe (h,g)  | 0,4549                              |         |          |  |
| ng   | 435,83   | 1,70301 | <u>Deviation of Relative Partial Dispersions</u>    |          |           | Pe (g,F')                           | 0,4876  |          |  |
| nF'  | 479,99   | 1,69670 | delta Pe (i,F')                                     | -0,0380  | Pe (F',e) | 0,5129                              |         |          |  |
| n488,0   | 488,00   | 1,69574 | delta Pe (g,F')                                     | -0,0037  | Pe (e,d)  | 0,2355                              |         |          |  |
| ne   | 546,07   | 1,69006 | delta Pe (F',e)                                     | 0,0005   | Pe (d,C') | 0,2515                              |         |          |  |
| nd   | 587,56   | 1,68701 | delta Pe (F',r)                                     | -0,0024  | Pe (e,C') | 0,4870                              |         |          |  |
| n632,8   | 632,80   | 1,68433 | <u>Chemical Properties</u>                          |          |           | Pe (C,r)                            | 0,2150  |          |  |
| nC'  | 643,85   | 1,68376 | Water Resistance                                    | WRs      | u         | Pe (r,s)                            | 0,3480  |          |  |
| n694,3   | 694,30   | 1,68146 | Acide Resistance                                    | AR*      | 6         | Pe (s,t)                            | 0,2570  |          |  |
| nr   | 706,52   | 1,68097 |   |          |           | <u>Internal Transmittance</u>       |         |          |  |
| ns   | 852,10   | 1,67646 |   |          |           | 10 mm                               |         |          |  |
| nt   | 1 013,90 | 1,67313 |   |          |           | T 365                               | 0,808   |          |  |
| n1060,0  | 1 060,00 | 1,67235 |   |          |           | T 400                               | 0,945   |          |  |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                               | 0,974   |          |  |
| Transformation Temperature, C                      | Tg       | 610     | Density, g/c.cm.                                    | SG       | 4,22      | T 550                               | 0,995   |          |  |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 94      | Grindability  | HG       | HG2       | T 640                               | 0,996   |          |  |
|  |          |         | Knoop Hardness                                      | KH       | 412,00    | Ta                                  | 0,995   |          |  |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,40      |                                     |         |          |  |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |           | <u>Other Properties</u>             |         |          |  |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | -40      | Bubble    |                                     | B       | 4        |  |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | -23      | Farbcode  |                                     | FC      | 340      |  |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>88</b>   |          |           | <b>4 492 168 000</b>                |         |          |  |

| DATA SHEET                                 |          |         | CTK8  |          |        | 703 496                             |         |          |
|--|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                           | nd       | 1,70312 | Abbe Number   | Vd       | 49,69  | Dispersion                          | nF-nC   | 0,014150 |
|  | ne       | 1,70650 |   | Ve       | 49,41  |                                     | nF'-nC' | 0,014298 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,73908 | nF-nC   | 0,014150 |        | Pe (i,h)                            | 0,8060  |          |
| nh   | 404,66   | 1,72755 | nF'-nC'   | 0,014298 |        | Pe (h,g)                            | 0,4636  |          |
| ng   | 435,83   | 1,72092 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,4948  |          |
| nF'  | 479,99   | 1,71385 | delta Pe (i,F')                                     | -0,0320  |        | Pe (F',e)                           | 0,5141  |          |
| n488,0                                     | 488,00   | 1,71279 | delta Pe (g,F')                                     | -0,0023  |        | Pe (e,d)                            | 0,2358  |          |
| ne   | 546,07   | 1,70650 | delta Pe (F',e)                                     | -0,0007  |        | Pe (d,C')                           | 0,2501  |          |
| nd   | 587,56   | 1,70312 | delta Pe (F',r)                                     | -0,0009  |        | Pe (e,C')                           | 0,4859  |          |
| n632,8                                     | 632,80   | 1,70018 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,2140  |          |
| nC'  | 643,85   | 1,69955 | Water Resistance                                    | WRs      | s      | Pe (r,s)                            | 0,3430  |          |
| n694,3                                     | 694,30   | 1,69703 | Acide Resistance                                    | AR*      | 6      | Pe (s,t)                            | 0,2520  |          |
| nr   | 706,52   | 1,69649 | <u>Mechanical Properties</u>                        |          |        | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,69158 | Density, g\cm.                                      | SG       | 4,16   | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,68798 | Grindability  | HG       | HG2    | T 365                               | -       |          |
| n1060,0                                    | 1 060,00 | 1,68715 | Knoop Hardness                                      | KH       | 417,00 | T 400                               | 0,947   |          |
| <u>Thermal Properties</u>                  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,50   | T 440                               | 0,977   |          |
| Transformation Temperature, C              | Tg       | 605     | <u>Temperature Coefficient of Refractive Index</u>  |          |        | T 550                               | 0,996   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 92      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | -33    | T 640                               | 0,994   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | -23    | Ta                                  | 0,996   |          |
|  |          |         | <u>Other Properties</u>                             |          |        | Bubble                              | B       | 4        |
|  |          |         |   |          |        | Farbcode                            | FC      | 38\35    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>92</b>   |          |        | <b>4 492 169 000</b>                |         |          |

| DATA SHEET                                     |          |         | CTK9   |          |       | 742 502                             |         |          |
|--|----------|---------|--|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                               | nd       | 1,74253 | Abbe Number  | Vd       | 50,24 | Dispersion                          | nF-nC   | 0,014780 |
|  | ne       | 1,74605 |  | Ve       | 50,01 |                                     | nF'-nC' | 0,014918 |
| <u>Refractive Indices</u>                      |          |         | <u>Partial Dispersions</u>                               |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,77938 | nF-nC  | 0,014780 |       | Pe (i,h)                            | 0,7820  |          |
| nh   | 404,66   | 1,76772 | nF'-nC'  | 0,014918 |       | Pe (h,g)                            | 0,4535  |          |
| ng   | 435,83   | 1,76095 | <u>Deviation of Relative Partial Dispersions</u>         |          |       | Pe (g,F')                           | 0,4876  |          |
| nF'  | 479,99   | 1,75368 | delta Pe (i,F')  | -0,0690  |       | Pe (F',e)                           | 0,5118  |          |
| n488,0   | 488,00   | 1,75258 | delta Pe (g,F')  | -0,0086  |       | Pe (e,d)                            | 0,2356  |          |
| ne   | 546,07   | 1,74605 | delta Pe (F',e)  | -0,0026  |       | Pe (d,C')                           | 0,2525  |          |
| nd   | 587,56   | 1,74253 | delta Pe (F',r)  | 0,0021   |       | Pe (e,C')                           | 0,4882  |          |
| n632,8   | 632,80   | 1,73943 | <u>Chemical Properties</u>                               |          |       | Pe (C,r)                            | 0,2170  |          |
| nC'  | 643,85   | 1,73876 | Water Resistance   | WRs      | s     | Pe (r,s)                            | 0,3540  |          |
| n694,3   | 694,30   | 1,73609 | Acide Resistance   | AR*      | 4     | Pe (s,t)                            | 0,2670  |          |
| nr   | 706,52   | 1,73552 | <u>Mechanical Properties</u>                             |          |       | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,73024 | Density, glc.cm.   | SG       | 4,11  | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,72625 | Grindability   | HG       | HG4   | T 365                               | 0,626   |          |
| n1060,0  | 1 060,00 | 1,72531 | Knoop Hardness   | KH       | -     | T 400                               | 0,911   |          |
| <u>Termal Properties</u>                       |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>^</sup> -5 Pa | K        | 2,00  | T 440                               | 0,968   |          |
| Transformation<br>Temperature, C               | Tg       | 630     | <u>Temperature Coefficient of Refractive Index</u>       |          |       | T 550                               | 0,994   |          |
| Expansion<br>Coefficient, 10 <sup>^</sup> -7/C | Alpha    | 57      | Range of Temperature, C: - 60 ... 20, C'-Line            | NTabs    | 34    | T 640                               | 0,993   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line             | NTabs    | 55    | Ta                                  | 0,994   |          |
|  |          |         |  |          |       | <u>Other Properties</u>             |         |          |
|  |          |         |  |          |       | Bubble                              | B       | 4        |
|  |          |         |  |          |       | Farbcode                            | FC      | 39\35    |
| <b>PG&amp;F, TM (UA)</b>                       |          |         | <b>99</b>  |          |       | <b>4 492 170 000</b>                |         |          |

| DATA SHEET                                    |          |         | CTK10  |          |       | 737 481                              |         |          |
|---|----------|---------|--|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                              | nd       | 1,73794 | Abbe Number  | Vd       | 48,11 | Dispersion                           | nF-nC   | 0,015340 |
|   | ne       | 1,74158 |  | Ve       | 47,86 |                                      | nF'-nC' | 0,015496 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,77653 | nF-nC  | 0,015340 |       | Pe (i,h)                             | 0,7870  |          |
| nh  | 404,66   | 1,76434 | nF'-nC'  | 0,015496 |       | Pe (h,g)                             | 0,4626  |          |
| ng  | 435,83   | 1,75717 | <u>Deviation of Realative Partial Dispersions</u>      |          |       | Pe (g,F')                            | 0,4918  |          |
| nF'   | 479,99   | 1,74955 | delta Pe (i,F')  | -0,0700  |       | Pe (F',e)                            | 0,5141  |          |
| n488,0  | 488,00   | 1,74839 | delta Pe (g,F')  | -0,0075  |       | Pe (e,d)                             | 0,2355  |          |
| ne  | 546,07   | 1,74158 | delta Pe (F',e)  | -0,0014  |       | Pe (d,C')                            | 0,2504  |          |
| nd  | 587,56   | 1,73794 | delta Pe (F',r)  | 0,0008   |       | Pe (e,C')                            | 0,4858  |          |
| n632,8  | 632,80   | 1,73474 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                             | 0,2150  |          |
| nC'   | 643,85   | 1,73406 | Water Resistance                                       | WRs      | s     | Pe (r,s)                             | 0,3480  |          |
| n694,3  | 694,30   | 1,73131 | Acide Resistance                                       | AR*      | 4     | Pe (s,t)                             | 0,2590  |          |
| nr  | 706,52   | 1,73073 | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>        |         |          |
| ns  | 852,10   | 1,72534 | Density, g/c.cm.                                       | SG       | 4,10  | 10 mm                                |         |          |
| nt  | 1 013,90 | 1,72132 | Grindability   | HG       | HG4   | T 365                                | 0,720   |          |
| n1060,0                                       | 1 060,00 | 1,72037 | Knoop Hardness   | KH       | -     | T 400                                | 0,949   |          |
| <u>Termal Properties</u>                      |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 2,40  | T 440                                | 0,983   |          |
| Transformation<br>Temperature, C              | Tg       | 570     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550                                | 0,995   |          |
| Expansion<br>Coefficient, 10 <sup>-7</sup> /C | Alpha    | 54      | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | 61    | T 640                                | 0,995   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 81    | Ta                                   | 0,995   |          |
|   |          |         | <u>Other Properties</u>                                |          |       | Bubble                               | B       | 5        |
|   |          |         |  |          |       | Farbcode                             | FC      | 38\35    |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>97</b>  |          |       | <b>4 492 172 000</b>                 |         |          |

| DATA SHEET                                 |          |         | CTK12   |          |       | 692 550                              |         |          |
|--|----------|---------|---|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                           | nd       | 1,69201 | Abbe Number   | Vd       | 55,01 | Dispersion                           | nF-nC   | 0,012580 |
|  | ne       | 1,69501 |   | Ve       | 54,79 |                                      | nF'-nC' | 0,012684 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,72292 | nF-nC   | 0,012580 |       | Pe (i,h)                             | 0,7600  |          |
| nh   | 404,66   | 1,71328 | nF'-nC'   | 0,012684 |       | Pe (h,g)                             | 0,4486  |          |
| ng   | 435,83   | 1,70759 | <u>Deviation of Realative Partial Dispersions</u>   |          |       | Pe (g,F')                            | 0,4824  |          |
| nF'  | 479,99   | 1,70147 | delta Pe (i,F')                                     | -0,0560  |       | Pe (F',e)                            | 0,5094  |          |
| n488,0                                     | 488,00   | 1,70054 | delta Pe (g,F')                                     | -0,0066  |       | Pe (e,d)                             | 0,2363  |          |
| ne   | 546,07   | 1,69501 | delta Pe (F',e)                                     | -0,0022  |       | Pe (d,C')                            | 0,2542  |          |
| nd   | 587,56   | 1,69201 | delta Pe (F',r)                                     | 0,0018   |       | Pe (e,C')                            | 0,4905  |          |
| n632,8                                     | 632,80   | 1,68936 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                             | 0,2210  |          |
| nC'  | 643,85   | 1,68879 | Water Resistance                                    | WRs      | s     | Pe (r,s)                             | 0,3670  |          |
| n694,3                                     | 694,30   | 1,68648 | Acide Resistance                                    | AR*      | 5     | Pe (s,t)                             | 0,2850  |          |
| nr   | 706,52   | 1,68599 | <u>Mechanical Properties</u>                        |          |       | <u>Internal Transmittance</u>        |         |          |
| ns   | 852,10   | 1,68134 | Density, g\c.cm.                                    | SG       | 3,46  | 10 mm                                |         |          |
| nt   | 1 013,90 | 1,67772 | Grindability  | HG       | HG4   | T 365                                | 0,832   |          |
| n1060,0                                    | 1 060,00 | 1,67684 | Knoop Hardness                                      | KH       | -     | T 400                                | 0,975   |          |
| <u>Termal Properties</u>                   |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,85  | T 440                                | 0,986   |          |
| Transformation Temperature, C              | Tg       | 640     | <u>Temperature Coefficient of Refractive Index</u>  |          |       | T 550                                | 0,997   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 67      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | 12    | T 640                                | 0,995   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 24    | Ta                                   | 0,997   |          |
|  |          |         |   |          |       | <u>Other Properties</u>              |         |          |
|  |          |         |   |          |       | Bubble                               | B       | 4        |
|  |          |         |   |          |       | Farbcode                             | FC      | 36\33    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>91</b>   |          |       | <b>4 492 174 000</b>                 |         |          |

| DATA SHEET                                  |          |         | CTK15   |          |       | 709 547                             |         |          |
|---|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                            | nd       | 1,70931 | Abbe Number   | Vd       | 54,77 | Dispersion                          | nF-nC   | 0,012950 |
|   | ne       | 1,71240 |   | Ve       | 54,56 |                                     | nF'-nC' | 0,013058 |
| <u>Refractive Indices</u>                   |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,74130 | nF-nC   | 0,012950 |       | Pe (i,h)                            | 0,7700  |          |
| nh  | 404,66   | 1,73125 | nF'-nC'   | 0,013058 |       | Pe (h,g)                            | 0,4505  |          |
| ng  | 435,83   | 1,72537 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,4828  |          |
| nF'   | 479,99   | 1,71906 | delta Pe (i,F')                                     | -0,0460  |       | Pe (F',e)                           | 0,5100  |          |
| n488,0                                      | 488,00   | 1,71811 | delta Pe (g,F')                                     | -0,0066  |       | Pe (e,d)                            | 0,2366  |          |
| ne  | 546,07   | 1,71240 | delta Pe (F',e)                                     | -0,0018  |       | Pe (d,C')                           | 0,2534  |          |
| nd  | 587,56   | 1,70931 | delta Pe (F',r)                                     | 0,0031   |       | Pe (e,C')                           | 0,4901  |          |
| n632,8                                      | 632,80   | 1,70658 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2220  |          |
| nC'   | 643,85   | 1,70600 | Water Resistance                                    | WRs      | u     | Pe (r,s)                            | 0,3650  |          |
| n694,3                                      | 694,30   | 1,70362 | Acide Resistance                                    | AR*      | 4     | Pe (s,t)                            | 0,2830  |          |
| nr  | 706,52   | 1,70311 | <u>Mechanical Properties</u>                        |          |       | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,69834 | Density, g\c.cm.                                    | SG       | 3,77  | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,69464 | Grindability  | HG       | HG4   | T 365                               | 0,593   |          |
| n1060,0                                     | 1 060,00 | 1,69374 | Knoop Hardness                                      | KH       | -     | T 400                               | 0,922   |          |
| <u>Termal Properties</u>                    |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,70  | T 440                               | 0,982   |          |
| Transformation Temperature, C               | Tg       | 645     | <u>Temperature Coefficient of Refractive Index</u>  |          |       | T 550                               | 0,996   |          |
| Exspansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 64      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | 14    | T 640                               | 0,995   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 29    | Ta                                  | 0,996   |          |
|   |          |         |   |          |       | <u>Other Properties</u>             |         |          |
|   |          |         |   |          |       | Bubble                              | B       | 5        |
|   |          |         |   |          |       | Farbcode                            | FC      | 39\36    |
| <b>PG&amp;F, TM (UA)</b>                    |          |         | <b>93</b>   |          |       | <b>4 492 176 000</b>                |         |          |

| DATA SHEET                                 |          |         | CTK16   |          |       | 785 456                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                           | nd       | 1,78595 | Abbe Number   | Vd       | 45,62 | Dispersion                          | nF-nC   | 0,017230 |
|  | ne       | 1,79005 |   | Ve       | 45,37 |                                     | nF'-nC' | 0,017415 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,82999 | nF-nC   | 0,017230 |       | Pe (i,h)                            | 0,8150  |          |
| nh   | 404,66   | 1,81579 | nF'-nC'   | 0,017415 |       | Pe (h,g)                            | 0,4668  |          |
| ng   | 435,83   | 1,80766 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,4961  |          |
| nF'  | 479,99   | 1,79902 | delta Pe (i,F')                                     | -0,0570  |       | Pe (F',e)                           | 0,5153  |          |
| n488,0                                     | 488,00   | 1,79772 | delta Pe (g,F')                                     | -0,0069  |       | Pe (e,d)                            | 0,2353  |          |
| ne   | 546,07   | 1,79005 | delta Pe (F',e)                                     | -0,0018  |       | Pe (d,C')                           | 0,2495  |          |
| nd   | 587,56   | 1,78595 | delta Pe (F',r)                                     | 0,0019   |       | Pe (e,C')                           | 0,4848  |          |
| n632,8                                     | 632,80   | 1,78236 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2140  |          |
| nC'  | 643,85   | 1,78160 | Water Resistance                                    | WRs      | u     | Pe (r,s)                            | 0,3420  |          |
| n694,3                                     | 694,30   | 1,77854 | Acide Resistance                                    | AR*      | 4     | Pe (s,t)                            | 0,2530  |          |
| nr   | 706,52   | 1,77788 | <u>Mechanical Properties</u>                        |          |       | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,77192 | Density, g\c.cm.                                    | SG       | 4,61  | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,76751 | Grindability  | HG       | HG4   | T 365                               | 0,608   |          |
| n1060,0                                    | 1 060,00 | 1,76648 | Knoop Hardness                                      | KH       | -     | T 400                               | 0,893   |          |
| <u>Thermal Properties</u>                  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,85  | T 440                               | 0,973   |          |
| Transformation Temperature, C              | Tg       | 615     | <u>Temperature Coefficient of Refractive Index</u>  |          |       | T 550                               | 0,994   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 66      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | 32    | T 640                               | 0,989   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 51    | Ta                                  | 0,994   |          |
|  |          |         | <u>Other Properties</u>                             |          |       | Bubble                              | B       | 4        |
|  |          |         |   |          |       | Farbcode                            | FC      | 38\36    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>108</b>  |          |       | <b>4 492 177 000</b>                |         |          |

| DATA SHEET                                 |          |         | CTK19   |          |       | 744 504                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                           | nd       | 1,74413 | Abbe Number   | Vd       | 50,42 | Dispersion                          | nF-nC   | 0,014760 |
|  | ne       | 1,74765 |   | Ve       | 50,19 |                                     | nF'-nC' | 0,014895 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,78099 | nF-nC   | 0,014760 |       | Pe (i,h)                            | 0,7850  |          |
| nh   | 404,66   | 1,76930 | nF'-nC'   | 0,014895 |       | Pe (h,g)                            | 0,4541  |          |
| ng   | 435,83   | 1,76254 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,4877  |          |
| nF'  | 479,99   | 1,75527 | delta Pe (i,F')                                     | -0,0520  |       | Pe (F',e)                           | 0,5120  |          |
| n488,0                                     | 488,00   | 1,75418 | delta Pe (g,F')                                     | -0,0082  |       | Pe (e,d)                            | 0,2361  |          |
| ne   | 546,07   | 1,74765 | delta Pe (F',e)                                     | -0,0024  |       | Pe (d,C')                           | 0,2519  |          |
| nd   | 587,56   | 1,74413 | delta Pe (F',r)                                     | 0,0019   |       | Pe (e,C')                           | 0,4881  |          |
| n632,8                                     | 632,80   | 1,74105 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2170  |          |
| nC'  | 643,85   | 1,74038 | Water Resistance                                    | WRs      | s     | Pe (r,s)                            | 0,3550  |          |
| n694,3                                     | 694,30   | 1,73772 | Acide Resistance                                    | AR*      | 4     | Pe (s,t)                            | 0,2690  |          |
| nr   | 706,52   | 1,73714 | <u>Mechanical Properties</u>                        |          |       | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,73850 | Density, g/c.cm.                                    | SG       | 4,09  | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,72784 | Grindability  | HG       | HG4   | T 365                               | 0,810   |          |
| n1060,0                                    | 1 060,00 | 1,72692 | Knoop Hardness                                      | KH       | -     | T 400                               | 0,954   |          |
| <u>Thermal Properties</u>                  |          |         | Photoelastic Coefficient, nm/cm 10 <sup>-5</sup> Pa | K        | 1,95  | T 440                               | 0,973   |          |
| Transformation Temperature, C              | Tg       | 625     | <u>Temperature Coefficient of Refractive Index</u>  |          |       | T 550                               | 0,996   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 59      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | 37    | T 640                               | 0,996   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 54    | Ta                                  | 0,996   |          |
|  |          |         |   |          |       | <u>Other Properties</u>             |         |          |
|  |          |         |   |          |       | Bubble                              | B       | 4        |
|  |          |         |   |          |       | Farbcode                            | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>100</b>  |          |       | <b>4 492 178 000</b>                |         |          |



| DATA SHEET   |          |         | CTK20   |          |           | 764 502                             |         |          |
|--|----------|---------|---|----------|-----------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,76483 | Abbe Number   | Vd       | 50,25     | Dispersion                          | nF-nC   | 0,015220 |
|  | ne       | 1,76846 |   | Ve       | 50,02     |                                     | nF'-nC' | 0,015362 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | -       | nF-nC   | 0,015220 | Pe (i,h)  | -                                   |         |          |
| nh   | 404,66   | 1,79084 | nF'-nC'   | 0,015362 | Pe (h,g)  | 0,4561                              |         |          |
| ng   | 435,83   | 1,78383 |   |          | Pe (g,F') | 0,4886                              |         |          |
| nF'  | 479,99   | 1,77633 | <u>Deviation of Realative Partial Dispersions</u>   |          |           | Pe (F',e)                           | 0,5120  |          |
| n488,0   | 488,00   | 1,77519 | delta Pe (i,F')                                     | -        | Pe (e,d)  | 0,2366                              |         |          |
| ne   | 546,07   | 1,76846 | delta Pe (g,F')                                     | -0,0070  | Pe (d,C') | 0,2515                              |         |          |
| nd   | 587,56   | 1,76483 | delta Pe (F',e)                                     | -0,0024  | Pe (e,C') | 0,4881                              |         |          |
| n632,8   | 632,80   | 1,76165 | delta Pe (F',r)                                     | 0,0017   | Pe (C,r)  | 0,2170                              |         |          |
| nC'  | 643,85   | 1,76096 | <u>Chemical Properties</u>                          |          |           | Pe (r,s)                            | 0,3550  |          |
| n694,3   | 694,30   | 1,75821 | Water Resistance                                    | WRs      | s         | Pe (s,t)                            | 0,2700  |          |
| nr   | 706,52   | 1,75763 | Acide Resistance                                    | AR*      | 4         | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,75217 |   |          |           | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,74802 |   |          |           | T 365                               | 0,897   |          |
| n1060,0  | 1 060,00 | 1,74703 |   |          |           | T 400                               | 0,949   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                               | 0,983   |          |
| Transformation Temperature, C                      | Tg       | 675     | Density, g/c.cm.                                    | SG       | 4,36      | T 550                               | -       |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 62      | Grindability  | HG       | HG5       | T 640                               | 0,997   |          |
|  |          |         | Knoop Hardness                                      | KH       | -         | Ta                                  | 0,998   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,45      |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |           |                                     |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    | -5      | Bubble  | B        | 4         |                                     |         |          |
| Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    | 29      | Farbcode  | FC       | 36\34     |                                     |         |          |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>103</b>  |          |           | <b>4 492 180 000</b>                |         |          |

| DATA SHEET                                    |          |         | BF1  |          |       | 524 549                             |         |          |
|---|----------|---------|--|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                              | nd       | 1,52479 | Abbe Number  | Vd       | 54,95 | Dispersion                          | nF-nC   | 0,009550 |
|   | ne       | 1,52706 |  | Ve       | 54,69 |                                     | nF'-nC' | 0,009638 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,54879 | nF-nC  | 0,009550 |       | Pe (i,h)                            | 0,7970  |          |
| nh  | 404,66   | 1,54111 | nF'-nC'  | 0,009638 |       | Pe (h,g)                            | 0,4571  |          |
| ng  | 435,83   | 1,53670 | <u>Deviation of Relative Partial Dispersions</u>       |          |       | Pe (g,F')                           | 0,4885  |          |
| nF'   | 479,99   | 1,53200 | delta Pe (i,F')  | -0,0050  |       | Pe (F',e)                           | 0,5118  |          |
| n488,0  | 488,00   | 1,53128 | delta Pe (g,F')  | -0,0007  |       | Pe (e,d)                            | 0,2362  |          |
| ne  | 546,07   | 1,52706 | delta Pe (F',e)  | 0,0000   |       | Pe (d,C')                           | 0,2520  |          |
| nd  | 587,56   | 1,52479 | delta Pe (F',r)  | -0,0011  |       | Pe (e,C')                           | 0,4882  |          |
| n632,8  | 632,80   | 1,52279 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                            | 0,2180  |          |
| nC'   | 643,85   | 1,52236 | Water Resistance                                       | WRs      | B     | Pe (r,s)                            | 0,3580  |          |
| n694,3  | 694,30   | 1,52063 | Acide Resistance                                       | AR*      | 1     | Pe (s,t)                            | 0,2750  |          |
| nr  | 706,52   | 1,52026 | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,51681 | Density, g/c.cm.                                       | SG       | 2,67  | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,51416 | Grindability   | HG       | HG3   | T 365                               | 0,967   |          |
| n1060,0                                       | 1 060,00 | 1,51352 | Knoop Hardness   | KH       | -     | T 400                               | 0,992   |          |
| <u>Termal Properties</u>                      |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 3,25  | T 440                               | 0,992   |          |
| Transformation<br>Temperature, C              | Tg       | 530     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550                               | 0,995   |          |
| Expansion<br>Coefficient, 10 <sup>-7</sup> /C | Alpha    | 73      | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | 14    | T 640                               | 0,993   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 31    | Ta                                  | 0,995   |          |
|   |          |         | <u>Other Properties</u>                                |          |       | Bubble                              | B       | 4        |
|   |          |         |  |          |       | Farbcode                            | FC      | 35\33    |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>20</b>  |          |       | <b>4 492 217 000</b>                |         |          |

| DATA SHEET   |          |         | BF4   |          |       | 548 539                              |         |          |
|--|----------|---------|---|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,54809 | Abbe Number   | Vd       | 53,95 | Dispersion                           | nF-nC   | 0,010160 |
|  | ne       | 1,55050 |   | Ve       | 53,66 |                                      | nF'-nC' | 0,010259 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,57371 | nF-nC   | 0,010160 |       | Pe (i,h)                             | 0,7970  |          |
| nh   | 404,66   | 1,56553 | nF'-nC'   | 0,010259 |       | Pe (h,g)                             | 0,4605  |          |
| ng   | 435,83   | 1,56081 | <u>Deviation of Realative Partial Dispersions</u>   |          |       | Pe (g,F')                            | 0,4911  |          |
| nF'  | 479,99   | 1,55577 |   |          |       | delta Pe (i,F')                      | -0,0080 |          |
| n488,0   | 488,00   | 1,55501 | delta Pe (g,F')                                     | 0,0004   |       | Pe (e,d)                             | 0,2353  |          |
| ne   | 546,07   | 1,55050 | delta Pe (F',e)                                     | 0,0008   |       | Pe (d,C')                            | 0,2516  |          |
| nd   | 587,56   | 1,54809 | delta Pe (F',r)                                     | -0,0015  |       | Pe (e,C')                            | 0,4869  |          |
| n632,8   | 632,80   | 1,54596 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                             | 0,2160  |          |
| nC'  | 643,85   | 1,54551 |   |          |       | Water Resistance                     | WRs     | A        |
| n694,3   | 694,30   | 1,54368 | Acide Resistance                                    | AR*      | 1     | <u>Internal Transmittance</u>        |         |          |
| nr   | 706,52   | 1,54329 |   |          |       | 10 mm                                |         |          |
| ns   | 852,10   | 1,53966 |   |          |       | T 365                                | 0,920   |          |
| nt   | 1 013,90 | 1,53690 | T 400   | 0,984    |       |                                      |         |          |
| n1060,0  | 1 060,00 | 1,53624 | T 440   | 0,986    |       |                                      |         |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |       | T 550                                | 0,995   |          |
|  |          |         |   |          |       | T 640                                | 0,993   |          |
| Transformation Temperature, C                      | Tg       | 580     | Density, g/c.cm.                                    | SG       | 2,92  | Ta                                   | 0,995   |          |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 74      | Grindability  | HG       | HG3   |                                      |         |          |
|  |          |         | Knoop Hardness                                      | KH       | -     |                                      |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,80  |                                      |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>              |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 2        |       | Bubble                               | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 20       |       | Farbcode                             | FC      | 36\33    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>31</b>   |          |       | <b>4 492 219 000</b>                 |         |          |

| DATA SHEET                                    |          |         | BF6  |          |       | 569 494                              |         |          |
|---|----------|---------|--|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                              | nd       | 1,56970 | Abbe Number  | Vd       | 49,45 | Dispersion                           | nF-nC   | 0,011520 |
|   | ne       | 1,57244 |  | Ve       | 49,16 |                                      | nF'-nC' | 0,011645 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,59929 | nF-nC  | 0,011520 |       | Pe (i,h)                             | 0,8240  |          |
| nh  | 404,66   | 1,58969 | nF'-nC'  | 0,011645 |       | Pe (h,g)                             | 0,4686  |          |
| ng  | 435,83   | 1,58423 | <u>Deviation of Realative Partial Dispersions</u>      |          |       | Pe (g,F')                            | 0,4970  |          |
| nF'   | 479,99   | 1,57844 | delta Pe (i,F')  | -0,0090  |       | Pe (F',e)                            | 0,5156  |          |
| n488,0  | 488,00   | 1,57757 | delta Pe (g,F')  | -0,0004  |       | Pe (e,d)                             | 0,2352  |          |
| ne  | 546,07   | 1,57244 | delta Pe (F',e)  | 0,0007   |       | Pe (d,C')                            | 0,2492  |          |
| nd  | 587,56   | 1,56970 | delta Pe (F',r)  | -0,0017  |       | Pe (e,C')                            | 0,4844  |          |
| n632,8  | 632,80   | 1,56731 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                             | 0,2130  |          |
| nC'   | 643,85   | 1,56680 | Water Resistance                                       | WRs      | A     | Pe (r,s)                             | 0,3410  |          |
| n694,3  | 694,30   | 1,56476 | Acide Resistance                                       | AR*      | 2     | Pe (s,t)                             | 0,2500  |          |
| nr  | 706,52   | 1,56432 | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>        |         |          |
| ns  | 852,10   | 1,56035 | Density, g/c.cm.                                       | SG       | 3,16  | 10 mm                                |         |          |
| nt  | 1 013,90 | 1,55744 | Grindability   | HG       | HG3   | T 365                                | 0,952   |          |
| n1060,0                                       | 1 060,00 | 1,55676 | Knoop Hardness   | KH       | -     | T 400                                | 0,988   |          |
| <u>Termal Properties</u>                      |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 3,05  | T 440                                | 0,988   |          |
| Transformation<br>Temperature, C              | Tg       | 540     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550                                | 0,995   |          |
| Expansion Coefficient,<br>10 <sup>-7</sup> /C | Alpha    | 84      | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | 2     | T 640                                | 0,994   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 18    | Ta                                   | 0,995   |          |
|   |          |         |  |          |       | <u>Other Properties</u>              |         |          |
|   |          |         |  |          |       | Bubble                               | B       | 4        |
|   |          |         |  |          |       | Farbcode                             | FC      | 36\33    |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>37</b>  |          |       | <b>4 492 221 000</b>                 |         |          |

| DATA SHEET   |          |         | BF7  |          |        | 579 538                              |         |          |
|--|----------|---------|--|----------|--------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,57960 | Abbe Number  | Vd       | 53,87  | Dispersion                           | nF-nC   | 0,010760 |
|  | ne       | 1,58216 |  | Ve       | 53,57  |                                      | nF'-nC' | 0,010867 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                           |          |        | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,60665 | nF-nC  | 0,010760 |        | Pe (i,h)                             | 0,7910  |          |
| nh   | 404,66   | 1,59805 | nF'-nC'  | 0,010867 |        | Pe (h,g)                             | 0,4581  |          |
| ng   | 435,83   | 1,59307 | <u>Deviation of Realative Partial Dispersions</u>    |          |        | Pe (g,F')                            | 0,4905  |          |
| nF'  | 479,99   | 1,58774 |  |          |        | delta Pe (i,F')                      | -0,0180 |          |
| n488,0   | 488,00   | 1,58693 | delta Pe (g,F')                                      | -0,0004  |        | Pe (e,d)                             | 0,2359  |          |
| ne   | 546,07   | 1,58216 | delta Pe (F',e)                                      | 0,0013   |        | Pe (d,C')                            | 0,2504  |          |
| nd   | 587,56   | 1,57960 | delta Pe (F',r)                                      | 0,0006   |        | Pe (e,C')                            | 0,4863  |          |
| n632,8   | 632,80   | 1,57735 | <u>Chemical Properties</u>                           |          |        | Pe (C,r)                             | 0,2170  |          |
| nC'  | 643,85   | 1,57687 |  |          |        | Water Resistance                     | WRs     | A        |
| n694,3   | 694,30   | 1,57494 | Acide Resistance                                     | AR*      | 4      | <u>Internal Transmittance</u>        |         |          |
| nr   | 706,52   | 1,57452 |  |          |        | 10 mm                                |         |          |
| ns   | 852,10   | 1,57072 |  |          |        | T 365                                | 0,881   |          |
| nt   | 1 013,90 | 1,56787 | T 400  | 0,981    |        |                                      |         |          |
| n1060,0  | 1 060,00 | 1,56720 | T 440  | 0,988    |        |                                      |         |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                         |          |        | T 550                                | 0,996   |          |
| Transformation Temperature, C                      | Tg       | 560     | Density, g/c.cm.                                     | SG       | 3,23   | T 640                                | 0,994   |          |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 74      | Grindability   | HG       | HG3    | Ta                                   | 0,996   |          |
|  |          |         | Knoop Hardness                                       | KH       | 434,00 |                                      |         |          |
|  |          |         | Photoelastic Coefficient, nm/lcm 10 <sup>-5</sup> Pa | K        | 3,00   |                                      |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |  |          |        | <u>Other Properties</u>              |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs  | 19       |        | Bubble                               | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs  | 37       |        | Farbcode                             | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>42</b>  |          |        | <b>4 492 223 000</b>                 |         |          |

| DATA SHEET   |          |         | BF8   |          |        | 582 464                              |         |          |           |        |
|--|----------|---------|---|----------|--------|--------------------------------------|---------|----------|-----------|--------|
| Refractive Index                                   | nd       | 1,58271 | Abbe Number   | Vd       | 46,47  | Dispersion                           | nF-nC   | 0,012540 |           |        |
|  | ne       | 1,58569 |   | Ve       | 46,17  |                                      | nF'-nC' | 0,012686 |           |        |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Realative Partial Dispersions</u> |         |          |           |        |
| ni   | 365,00   | 1,61535 | nF-nC   | 0,012540 |        | Pe (i,h)                             | 0,8410  |          |           |        |
| nh   | 404,66   | 1,60468 | nF'-nC'   | 0,012686 |        | Pe (h,g)                             | 0,4774  |          |           |        |
| ng   | 435,83   | 1,59862 | <u>Deviation of Realative Partial Dispersions</u>   |          |        | Pe (g,F')                            | 0,5028  |          |           |        |
| nF'  | 479,99   | 1,59224 |   |          |        | delta Pe (i,F')                      | -0,0060 |          | Pe (F',e) | 0,5166 |
| n488,0   | 488,00   | 1,59130 | delta Pe (g,F')                                     | 0,0010   |        | Pe (e,d)                             | 0,2347  |          |           |        |
| ne   | 546,07   | 1,58569 | delta Pe (F',e)                                     | 0,0001   |        | Pe (d,C')                            | 0,2487  |          |           |        |
| nd   | 587,56   | 1,58271 | delta Pe (F',r)                                     | -0,0022  |        | Pe (e,C')                            | 0,4834  |          |           |        |
| n632,8   | 632,80   | 1,58011 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                             | 0,2100  |          |           |        |
| nC'  | 643,85   | 1,57956 |   |          |        | Water Resistance                     | WRs     | A        | Pe (r,s)  | 0,3360 |
| n694,3   | 694,30   | 1,57736 | Acide Resistance                                    | AR*      | 2      | <u>Internal Transmittance</u>        |         |          |           |        |
| nr   | 706,52   | 1,57689 |   |          |        | 10 mm                                |         |          |           |        |
| ns   | 852,10   | 1,57263 |   |          |        | T 365                                |         |          | 0,935     |        |
| nt   | 1 013,90 | 1,56953 |   |          |        | T 400                                |         |          | 0,988     |        |
| n1060,0  | 1 060,00 | 1,56882 |   |          |        | T 440                                |         |          | 0,990     |        |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |        | T 550                                |         |          | 0,995     |        |
| Transformation Temperature, C                      | Tg       | 525     | Density, g/c.cm.                                    | SG       | 3,28   | T 640                                |         |          | 0,995     |        |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 82      | Grindability  | HG       | HG3    | Ta                                   |         |          | 0,995     |        |
|  |          |         | Knoop Hardness                                      | KH       | 367,00 |                                      |         |          |           |        |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,95   |                                      |         |          |           |        |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |        | <u>Other Properties</u>              |         |          |           |        |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 6        |        | Bubble                               | B       | 4        |           |        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 24       |        | Farbcode                             | FC      | 36\33    |           |        |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>47</b>   |          |        | <b>4 492 225 000</b>                 |         |          |           |        |

| DATA SHEET                                  |          |         | BF11  |          |        | 622 531                             |         |          |
|---|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                            | nd       | 1,62230 | Abbe Number   | Vd       | 53,14  | Dispersion                          | nF-nC   | 0,011710 |
|   | ne       | 1,62509 |   | Ve       | 52,85  |                                     | nF'-nC' | 0,011828 |
| <u>Refractive Indices</u>                   |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,65181 | nF-nC   | 0,011710 |        | Pe (i,h)                            | 0,7940  |          |
| nh  | 404,66   | 1,64242 | nF'-nC'   | 0,011828 |        | Pe (h,g)                            | 0,4596  |          |
| ng  | 435,83   | 1,63698 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,4918  |          |
| nF'   | 479,99   | 1,63117 | delta Pe (i,F')                                     | -0,0200  |        | Pe (F',e)                           | 0,5136  |          |
| n488,0                                      | 488,00   | 1,63029 | delta Pe (g,F')                                     | -0,0002  |        | Pe (e,d)                            | 0,2356  |          |
| ne  | 546,07   | 1,62509 | delta Pe (F',e)                                     | 0,0008   |        | Pe (d,C')                           | 0,2508  |          |
| nd  | 587,56   | 1,62230 | delta Pe (F',r)                                     | -0,0027  |        | Pe (e,C')                           | 0,4864  |          |
| n632,8                                      | 632,80   | 1,61986 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,2150  |          |
| nC'   | 643,85   | 1,61934 | Water Resistance                                    | WRs      | A      | Pe (r,s)                            | 0,3470  |          |
| n694,3                                      | 694,30   | 1,61724 | Acide Resistance                                    | AR*      | 4      | Pe (s,t)                            | 0,2560  |          |
| nr  | 706,52   | 1,61680 | <u>Mechanical Properties</u>                        |          |        | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,61270 | Density, g/c.cm.                                    | SG       | 3,66   | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,60967 | Grindability  | HG       | HG3    | T 365                               | 0,815   |          |
| n1060,0                                     | 1 060,00 | 1,60896 | Knoop Hardness                                      | KH       | 443,00 | T 400                               | 0,961   |          |
| <u>Termal Properties</u>                    |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,35   | T 440                               | 0,986   |          |
| Transformation Temperature, C               | Tg       | 620     | <u>Temperature Coefficient of Refractive Index</u>  |          |        | T 550                               | 0,996   |          |
| Exspansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 70      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | 20     | T 640                               | 0,994   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 40     | Ta                                  | 0,996   |          |
|   |          |         |   |          |        | <u>Other Properties</u>             |         |          |
|   |          |         |   |          |        | Bubble                              | B       | 5        |
|   |          |         |   |          |        | Farbcode                            | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                    |          |         | <b>67</b>   |          |        | <b>4 492 227 000</b>                |         |          |

| DATA SHEET   |          |         | BF12  |          |        | 626 391                             |         |          |
|--|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,62604 | Abbe Number   | Vd       | 39,10  | Dispersion                          | nF-nC   | 0,016010 |
|  | ne       | 1,62984 |   | Ve       | 38,82  |                                     | nF'-nC' | 0,016223 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,66901 | nF-nC   | 0,016010 |        | Pe (i,h)                            | 0,8880  |          |
| nh   | 404,66   | 1,65460 | nF'-nC'   | 0,016223 |        | Pe (h,g)                            | 0,4932  |          |
| ng   | 435,83   | 1,64660 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,5123  |          |
| nF'  | 479,99   | 1,63829 | delta Pe (i,F')                                     | -0,0020  |        | Pe (F',e)                           | 0,5210  |          |
| n488,0   | 488,00   | 1,63705 | delta Pe (g,F')                                     | -0,0005  |        | Pe (e,d)                            | 0,2340  |          |
| ne   | 546,07   | 1,62984 | delta Pe (F',e)                                     | 0,0002   |        | Pe (d,C')                           | 0,2450  |          |
| nd   | 587,56   | 1,62604 | delta Pe (F',r)                                     | -0,0010  |        | Pe (e,C')                           | 0,4790  |          |
| n632,8   | 632,80   | 1,62276 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,2060  |          |
| nC'  | 643,85   | 1,62207 | Water Resistance                                    | WRs      | A      | Pe (r,s)                            | 0,3230  |          |
| n694,3   | 694,30   | 1,61930 | Acide Resistance                                    | AR*      | 4      | Pe (s,t)                            | 0,2290  |          |
| nr   | 706,52   | 1,61872 | <u>Internal Transmittance</u>                       |          |        | 10 mm                               |         |          |
| ns   | 852,10   | 1,61348 |   |          |        | T 365                               | 0,824   |          |
| nt   | 1 013,90 | 1,60977 |   |          |        | T 400                               | 0,966   |          |
| n1060,0  | 1 060,00 | 1,60894 |   |          |        | T 440                               | 0,985   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |        | T 550                               | 0,996   |          |
| Transformation Temperature, C                      | Tg       | 495     | Density, g/c.cm.                                    | SG       | 3,67   | T 640                               | 0,993   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 88      | Grindability  | HG       | HG3    | Ta                                  | 0,996   |          |
|  |          |         | Knoop Hardness                                      | KH       | 377,00 |                                     |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,55   |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |        |                                     |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 6        |        | Bubble                              | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 23       |        | Farbcode                            | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>72</b>   |          |        | <b>4 492 229 000</b>                |         |          |



| DATA SHEET                                 |          |         | BF13  |          |        | 639 482                             |         |          |
|--|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                           | nd       | 1,63962 | Abbe Number   | Vd       | 48,27  | Dispersion                          | nF-nC   | 0,013250 |
|  | ne       | 1,64277 |   | Ve       | 47,97  |                                     | nF'-nC' | 0,013398 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,67382 | nF-nC   | 0,013250 |        | Pe (i,h)                            | 0,8310  |          |
| nh   | 404,66   | 1,66268 | nF'-nC'   | 0,013398 |        | Pe (h,g)                            | 0,4721  |          |
| ng   | 435,83   | 1,65635 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,4982  |          |
| nF'  | 479,99   | 1,64968 | delta Pe (i,F')                                     | -0,0090  |        | Pe (F',e)                           | 0,5160  |          |
| n488,0                                     | 488,00   | 1,64868 | delta Pe (g,F')                                     | -0,0011  |        | Pe (e,d)                            | 0,2350  |          |
| ne   | 546,07   | 1,64277 | delta Pe (F',e)                                     | 0,0005   |        | Pe (d,C')                           | 0,2490  |          |
| nd   | 587,56   | 1,63962 | delta Pe (F',r)                                     | -0,0017  |        | Pe (e,C')                           | 0,4840  |          |
| n632,8                                     | 632,80   | 1,63687 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,2120  |          |
| nC'  | 643,85   | 1,63628 | Water Resistance                                    | WRs      | A      | Pe (r,s)                            | 0,3390  |          |
| n694,3                                     | 694,30   | 1,63394 | Acide Resistance                                    | AR*      | 4      | Pe (s,t)                            | 0,2480  |          |
| nr   | 706,52   | 1,63344 | <u>Mechanical Properties</u>                        |          |        | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,62890 | Density, g\cm.                                      | SG       | 3,82   | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,62558 | Grindability  | HG       | HG3    | T 365                               | 0,635   |          |
| n1060,0                                    | 1 060,00 | 1,62482 | Knoop Hardness                                      | KH       | 451,00 | T 400                               | 0,925   |          |
| <u>Termal Properties</u>                   |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,15   | T 440                               | 0,978   |          |
| Transformation Temperature, C              | Tg       | 605     | <u>Temperature Coefficient of Refractive Index</u>  |          |        | T 550                               | 0,995   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 67      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | 22     | T 640                               | 0,992   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 38     | Ta                                  | 0,995   |          |
|  |          |         | <u>Other Properties</u>                             |          |        |                                     |         |          |
|  |          |         | Bubble  | B        | 4      |                                     |         |          |
|  |          |         | Farbcode  | FC       | 38\36  |                                     |         |          |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>76</b>   |          |        | <b>4 492 231 000</b>                |         |          |

| DATA SHEET   |          |         | BF16  |          |           | 671 472                             |         |          |  |
|--|----------|---------|---|----------|-----------|-------------------------------------|---------|----------|--|
| Refractive Index                                   | nd       | 1,67102 | Abbe Number   | Vd       | 47,29     | Dispersion                          | nF-nC   | 0,014190 |  |
|  | ne       | 1,67438 |   | Ve       | 47,00     |                                     | nF'-nC' | 0,014350 |  |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Relative Partial Dispersions</u> |         |          |  |
| ni   | 365,00   | 1,70771 | nF-nC   | 0,014190 | Pe (i,h)  | 0,8330                              |         |          |  |
| nh   | 404,66   | 1,69576 | nF'-nC'   | 0,014350 | Pe (h,g)  | 0,4730                              |         |          |  |
| ng   | 435,83   | 1,68897 | <u>Deviation of Relative Partial Dispersions</u>    |          |           | Pe (g,F')                           | 0,4992  |          |  |
| nF'  | 479,99   | 1,68181 | delta Pe (i,F')                                     | -0,0150  | Pe (F',e) | 0,5174                              |         |          |  |
| n488,0   | 488,00   | 1,68073 | delta Pe (g,F')                                     | -0,0015  | Pe (e,d)  | 0,2341                              |         |          |  |
| ne   | 546,07   | 1,67438 | delta Pe (F',e)                                     | 0,0013   | Pe (d,C') | 0,2485                              |         |          |  |
| nd   | 587,56   | 1,67102 | delta Pe (F',r)                                     | -0,0014  | Pe (e,C') | 0,4826                              |         |          |  |
| n632,8   | 632,80   | 1,66809 | <u>Chemical Properties</u>                          |          |           | Pe (C,r)                            | 0,2120  |          |  |
| nC'  | 643,85   | 1,66746 | Water Resistance                                    | WRs      | A         | Pe (r,s)                            | 0,3370  |          |  |
| n694,3   | 694,30   | 1,66496 | Acide Resistance                                    | AR*      | 4         | Pe (s,t)                            | 0,2450  |          |  |
| nr   | 706,52   | 1,66442 |   |          |           | <u>Internal Transmittance</u>       |         |          |  |
| ns   | 852,10   | 1,65959 |   |          |           | 10 mm                               |         |          |  |
| nt   | 1 013,90 | 1,65608 |   |          |           | T 365                               | 0,600   |          |  |
| n1060,0  | 1 060,00 | 1,65527 |   |          |           | T 400                               | 0,915   |          |  |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                               | 0,973   |          |  |
| Transformation Temperature, C                      | Tg       | 605     | Density, glc.cm.                                    | SG       | 4,02      | T 550                               | 0,996   |          |  |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 84      | Grindability  | HG       | HG2       | T 640                               | 0,995   |          |  |
|  |          |         | Knoop Hardness                                      | KH       | 396,00    | Ta                                  | 0,996   |          |  |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,65      |                                     |         |          |  |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |           | <u>Other Properties</u>             |         |          |  |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 1        |           | Bubble                              | B       | 4        |  |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 19       |           | Farbcode                            | FC      | 38\36    |  |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>86</b>   |          |           | <b>4 492 233 000</b>                |         |          |  |

| DATA SHEET                                 |          |         | BF21  |          |        | 614 000                                       |         |          |
|--|----------|---------|---|----------|--------|---|---------|----------|
| Refractive Index                           | nd       | 1,61413 | Abbe Number   | Vd       | 40,03  | Dispersion                                    | nF-nC   | 0,015340 |
|  | ne       | 1,61777 |   | Ve       | 39,75  |   | nF'-nC' | 0,015540 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u>           |         |          |
| ni   | 365,00   | 1,65512 | nF-nC   | 0,015340 |        | Pe (i,h)                                      | 0,8820  |          |
| nh   | 404,66   | 1,64142 | nF'-nC'   | 0,015540 |        | Pe (h,g)                                      | 0,4906  |          |
| ng   | 435,83   | 1,63380 | <u>Deviation of Realative Partial Dispersions</u>   |          |        | Pe (g,F')                                     | 0,5112  |          |
| nF'  | 479,99   | 1,62585 |   |          |        | delta Pe (i,F')                               | -0,0040 |          |
| n488,0                                     | 488,00   | 1,62468 | delta Pe (g,F')                                     | -0,0002  |        | Pe (e,d)                                      | 0,2342  |          |
| ne   | 546,07   | 1,61777 | delta Pe (F',e)                                     | -0,0001  |        | Pe (d,C')                                     | 0,2456  |          |
| nd   | 587,56   | 1,61413 | delta Pe (F',r)                                     | -0,0003  |        | Pe (e,C')                                     | 0,4798  |          |
| n632,8                                     | 632,80   | 1,61098 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                                      | 0,2080  |          |
| nC'  | 643,85   | 1,61032 |   |          |        | Water Resistance                              | WRs     | A        |
| n694,3                                     | 694,30   | 1,60766 | Acide Resistance                                    | AR*      | 2      | Pe (s,t)                                      | 0,2320  |          |
| nr   | 706,52   | 1,60709 | <u>Mechanical Properties</u>                        |          |        | <u>Internal Transmittance</u>                 |         |          |
| ns   | 852,10   | 1,60203 |   |          |        | Density, g/c.cm.                              | SG      | 3,56     |
| nt   | 1 013,90 | 1,59843 | Grindability  | HG       | HG3    | T 365   | 0,826   |          |
| n1060,0                                    | 1 060,00 | 1,59762 | Knoop Hardness                                      | KH       | 385,00 | T 400   | 0,964   |          |
| <u>Termal Properties</u>                   |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,95   | T 440   | 0,983   |          |
| Transformation Temperature, C              | Tg       | 480     | <u>Temperature Coefficient of Refractive Index</u>  |          |        | T 550   | 0,996   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 77      |   |          |        | Range of Temperature, C: - 60 ... 20, C'-Line | NTabs   | 23       |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 45     | Ta  | 0,996   |          |
|  |          |         | <u>Other Properties</u>                             |          |        | Bubble  | B       | 4        |
|  |          |         |   |          |        | Farbcode                                      | FC      | 36\35    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>62</b>   |          |        | <b>4 492 239 000</b>                          |         |          |

| DATA SHEET   |          |         | BF24  |          |        | 634 367                                       |         |          |
|--|----------|---------|---|----------|--------|---|---------|----------|
| Refractive Index                                   | nd       | 1,63455 | Abbe Number   | Vd       | 36,76  | Dispersion                                    | nF-nC   | 0,017260 |
|  | ne       | 1,63864 |   | Ve       | 36,50  |   | nF'-nC' | 0,017496 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u>           |         |          |
| ni   | 365,00   | 1,68139 | nF-nC   | 0,017260 |        | Pe (i,h)                                      | 0,9070  |          |
| nh   | 404,66   | 1,66553 | nF'-nC'   | 0,017496 |        | Pe (h,g)                                      | 0,4988  |          |
| ng   | 435,83   | 1,65680 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                                     | 0,5159  |          |
| nF'  | 479,99   | 1,64778 |   |          |        | delta Pe (i,F')                               | 0,0040  |          |
| n488,0   | 488,00   | 1,64643 | delta Pe (g,F')                                     | -0,0003  |        | Pe (e,d)                                      | 0,2337  |          |
| ne   | 546,07   | 1,63864 | delta Pe (F',e)                                     | 0,0002   |        | Pe (d,C')                                     | 0,2440  |          |
| nd   | 587,56   | 1,63455 | delta Pe (F',r)                                     | -0,0003  |        | Pe (e,C')                                     | 0,4777  |          |
| n632,8   | 632,80   | 1,63103 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                                      | 0,2050  |          |
| nC'  | 643,85   | 1,63028 |   |          |        | Water Resistance                              | WRs     | A        |
| n694,3   | 694,30   | 1,62732 | Acide Resistance                                    | AR*      | 3      | <u>Internal Transmittance</u>                 |         |          |
| nr   | 706,52   | 1,62669 | <u>Mechanical Properties</u>                        |          |        | 10 mm   |         |          |
| ns   | 852,10   | 1,62108 |   |          |        | Density, g/c.cm.                              | SG      | 3,67     |
| nt   | 1 013,90 | 1,61712 | Grindability  | HG       | HG3    | T 400   | 0,940   |          |
| n1060,0  | 1 060,00 | 1,61623 | Knoop Hardness                                      | KH       | 393,00 | T 440   | 0,978   |          |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,65   | T 550   | 0,995   |          |
| Transformation Temperature, C                      | Tg       | 475     | <u>Temperature Coefficient of Refractive Index</u>  |          |        | T 640   | 0,993   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 78      |   |          |        | Range of Temperature, C: - 60 ... 20, C'-Line | NTabs   | 28       |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 49     | <u>Other Properties</u>                       |         |          |
|  |          |         |   |          |        | Bubble  | B       | 4        |
|  |          |         |   |          |        | Farbcode                                      | FC      | 38\36    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>74</b>   |          |        | <b>4 492 242 000</b>                          |         |          |

| DATA SHEET   |          |         | BF25  |          |       | 607 461                             |         |          |           |        |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|-----------|--------|
| Refractive Index                                   | nd       | 1,60772 | Abbe Number   | Vd       | 46,11 | Dispersion                          | nF-nC   | 0,013180 |           |        |
|  | ne       | 1,61085 |   | Ve       | 45,82 |                                     | nF'-nC' | 0,013332 |           |        |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |           |        |
| ni   | 365,00   | 1,64195 | nF-nC   | 0,013180 |       | Pe (i,h)                            | 0,8390  |          |           |        |
| nh   | 404,66   | 1,63077 | nF'-nC'   | 0,013332 |       | Pe (h,g)                            | 0,4757  |          |           |        |
| ng   | 435,83   | 1,62443 | <u>Deviation of Realative Partial Dispersions</u>   |          |       | Pe (g,F')                           | 0,5012  |          |           |        |
| nF'  | 479,99   | 1,61775 |   |          |       | delta Pe (i,F')                     | -0,0150 |          | Pe (F',e) | 0,5170 |
| n488,0   | 488,00   | 1,61675 | delta Pe (g,F')                                     | -0,0012  |       | Pe (e,d)                            | 0,2353  |          |           |        |
| ne   | 546,07   | 1,61085 | delta Pe (F',e)                                     | 0,0002   |       | Pe (d,C')                           | 0,2478  |          |           |        |
| nd   | 587,56   | 1,60772 | delta Pe (F',r)                                     | -0,0013  |       | Pe (e,C')                           | 0,4831  |          |           |        |
| n632,8   | 632,80   | 1,60499 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2110  |          |           |        |
| nC'  | 643,85   | 1,60441 |   |          |       | Water Resistance                    | WRs     | A        | Pe (r,s)  | 0,3350 |
| n694,3   | 694,30   | 1,60209 | Acide Resistance                                    | AR*      | 4     | <u>Internal Transmittance</u>       |         |          |           |        |
| nr   | 706,52   | 1,60160 |   |          |       | 10 mm                               |         |          |           |        |
| ns   | 852,10   | 1,59713 |   |          |       | T 365                               |         |          | 0,768     |        |
| nt   | 1 013,90 | 1,59388 |   |          |       | T 400                               |         |          | 0,955     |        |
| n1060,0  | 1 060,00 | 1,59313 |   |          |       | T 440                               |         |          | 0,979     |        |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |       | T 550                               |         |          | 0,996     |        |
| Transformation Temperature, C                      | Tg       | 565     | Density, g/c.cm.                                    | SG       | 3,47  | T 640                               |         |          | 0,991     |        |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 73      | Grindability  | HG       | HG3   | Ta                                  |         |          | 0,996     |        |
|  |          |         | Knoop Hardness                                      | KH       | -     |                                     |         |          |           |        |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,80  |                                     |         |          |           |        |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>             |         |          |           |        |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 29       |       | Bubble                              |         |          | B 4       |        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 46       |       | Farbcode                            |         |          | FC 38\35  |        |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>55</b>   |          |       | <b>4 492 243 000</b>                |         |          |           |        |

| DATA SHEET   |          |         | BF26   |          |       | 650 384                              |         |          |
|--|----------|---------|--|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,65055 | Abbe Number  | Vd       | 38,47 | Dispersion                           | nF-nC   | 0,016910 |
|  | ne       | 1,65456 |  | Ve       | 38,20 |                                      | nF'-nC' | 0,017136 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                         |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,69606 | nF-nC  | 0,016910 |       | Pe (i,h)                             | 0,8930  |          |
| nh   | 404,66   | 1,68076 | nF'-nC'  | 0,017136 |       | Pe (h,g)                             | 0,4943  |          |
| ng   | 435,83   | 1,67229 | <u>Deviation of Realative Partial Dispersions</u>  |          |       | Pe (g,F')                            | 0,5135  |          |
| nF'  | 479,99   | 1,66349 | delta Pe (i,F')                                    | -0,0010  |       | Pe (F',e)                            | 0,5212  |          |
| n488,0   | 488,00   | 1,66219 | delta Pe (g,F')                                    | -0,0003  |       | Pe (e,d)                             | 0,2341  |          |
| ne   | 546,07   | 1,65456 | delta Pe (F',e)                                    | 0,0001   |       | Pe (d,C')                            | 0,2444  |          |
| nd   | 587,56   | 1,65055 | delta Pe (F',r)                                    | -0,0005  |       | Pe (e,C')                            | 0,4785  |          |
| n632,8   | 632,80   | 1,64709 | <u>Chemical Properties</u>                         |          |       | Pe (C,r)                             | 0,2070  |          |
| nC'  | 643,85   | 1,64636 | Water Resistance                                   | WRs      | A     | Pe (r,s)                             | 0,3220  |          |
| n694,3   | 694,30   | 1,64344 | Acide Resistance                                   | AR*      | 4     | Pe (s,t)                             | 0,2260  |          |
| nr   | 706,52   | 1,64282 | <u>Mechanical Properties</u>                       |          |       | <u>Internal Transmittance</u>        |         |          |
| ns   | 852,10   | 1,63730 | Density, g/c.cm.                                   | SG       | 3,86  | 10 mm                                |         |          |
| nt   | 1 013,90 | 1,63342 | Grindability                                       | HG       | HG3   | T 365                                | 0,828   |          |
| n1060,0  | 1 060,00 | 1,63254 | Knoop Hardness                                     | KH       | -     | T 400                                | 0,936   |          |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient, nm\cm                    | K        | 2,45  | T 440                                | 0,982   |          |
| Transformation Temperature, C                      | Tg       | 540     | 10 <sup>-5</sup> Pa                                |          |       | T 550                                | 0,998   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 70      | <u>Temperature Coefficient of Refractive Index</u> |          |       | T 640                                | 0,995   |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | NTabs  | 39       |       | Ta                                   | 0,998   |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs  | 56       |       | <u>Other Properties</u>              |         |          |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         |  |          |       | Bubble                               | B       | 4        |
|  |          |         |  |          |       | Farbcode                             | FC      | 36\35    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>79</b>  |          |       | <b>4 492 245 000</b>                 |         |          |

| DATA SHEET                                    |          |         | BF27   |          |       | 606 439                                       |         |          |
|---|----------|---------|--|----------|-------|---|---------|----------|
| Refractive Index                              | nd       | 1,60682 | Abbe Number  | Vd       | 43,97 | Dispersion                                    | nF-nC   | 0,013800 |
|   | ne       | 1,61010 |  | Ve       | 43,68 |   | nF'-nC' | 0,013967 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Realative Partial Dispersions</u>          |         |          |
| ni  | 365,00   | 1,64309 | nF-nC  | 0,013800 |       | Pe (i,h)                                      | 0,8570  |          |
| nh  | 404,66   | 1,63112 | nF'-nC'  | 0,013967 |       | Pe (h,g)                                      | 0,4817  |          |
| ng  | 435,83   | 1,62439 | <u>Deviation of Realative Partial Dispersions</u>      |          |       | Pe (g,F')                                     | 0,5051  |          |
| nF'   | 479,99   | 1,61734 |  |          |       | delta Pe (i,F')                               | -0,0070 |          |
| n488,0  | 488,00   | 1,61628 | delta Pe (g,F')  | -0,0005  |       | Pe (e,d)                                      | 0,2344  |          |
| ne  | 546,07   | 1,61010 | delta Pe (F',e)  | 0,0006   |       | Pe (d,C')                                     | 0,2469  |          |
| nd  | 587,56   | 1,60682 | delta Pe (F',r)  | -0,0008  |       | Pe (e,C')                                     | 0,4813  |          |
| n632,8  | 632,80   | 1,60398 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                                      | 0,2100  |          |
| nC'   | 643,85   | 1,60337 |  |          |       | Water Resistance                              | WRs     | A        |
| n694,3  | 694,30   | 1,60095 | Acide Resistance                                       | AR*      | 4     | Pe (s,t)                                      | 0,2410  |          |
| nr  | 706,52   | 1,60044 | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>                 |         |          |
| ns  | 852,10   | 1,59580 |  |          |       | Density, g/c.cm.                              | SG      | 3,46     |
| nt  | 1 013,90 | 1,59244 | Grindability   | HG       | HG3   | T 365   | 0,891   |          |
| n1060,0                                       | 1 060,00 | 1,59166 | Knoop Hardness   | KH       | 417   | T 400   | 0,979   |          |
| <u>Termal Properties</u>                      |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 2,70  | T 440   | 0,988   |          |
| Transformation<br>Temperature, C              | Tg       | 525     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550   | 0,997   |          |
| Expansion Coefficient,<br>10 <sup>-7</sup> /C | Alpha    | 79      |  |          |       | Range of Temperature, C: - 60 ... 20, C'-Line | NTabs   | 19       |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 42    | Ta  | 0,997   |          |
|   |          |         | <u>Other Properties</u>                                |          |       | Bubble  | B       | 4        |
|   |          |         |  |          |       | Farbcode                                      | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>54</b>  |          |       | <b>4 492 246 000</b>                          |         |          |

| DATA SHEET  |          |         | BF28   |          |        | 664 354                              |         |          |
|---|----------|---------|--|----------|--------|--------------------------------------|---------|----------|
| Refractive Index                                  | nd       | 1,66426 | Abbe Number  | Vd       | 35,45  | Dispersion                           | nF-nC   | 0,018740 |
|   | ne       | 1,66871 |  | Ve       | 35,19  |                                      | nF'-nC' | 0,019005 |
| <u>Refractive Indices</u>                         |          |         | <u>Partial Dispersions</u>                             |          |        | <u>Realative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,71548 | nF-nC  | 0,018740 |        | Pe (i,h)                             | 0,9170  |          |
| nh  | 404,66   | 1,69805 | nF'-nC'  | 0,019005 |        | Pe (h,g)                             | 0,5023  |          |
| ng  | 435,83   | 1,68850 | <u>Deviation of Realative Partial Dispersions</u>      |          |        | Pe (g,F')                            | 0,5187  |          |
| nF'   | 479,99   | 1,67865 | delta Pe (i,F')  | 0,0080   |        | Pe (F',e)                            | 0,5227  |          |
| n488,0  | 488,00   | 1,67718 | delta Pe (g,F')  | 0,0005   |        | Pe (e,d)                             | 0,2341  |          |
| ne  | 546,07   | 1,66871 | delta Pe (F',e)  | -0,0001  |        | Pe (d,C')                            | 0,2431  |          |
| nd  | 587,56   | 1,66426 | delta Pe (F',r)  | -0,0036  |        | Pe (e,C')                            | 0,4773  |          |
| n632,8  | 632,80   | 1,66045 | <u>Chemical Properties</u>                             |          |        | Pe (C,r)                             | 0,2040  |          |
| nC'   | 643,85   | 1,65964 | Water Resistance                                       | WRs      | A      | Pe (r,s)                             | 0,3180  |          |
| n694,3  | 694,30   | 1,65644 | Acide Resistance                                       | AR*      | 3      | Pe (s,t)                             | 0,2230  |          |
| nr  | 706,52   | 1,65576 | <u>Mechanical Properties</u>                           |          |        | <u>Internal Transmittance</u>        |         |          |
| ns  | 852,10   | 1,64971 | Density, glc.cm.                                       | SG       | 3,96   | 10 mm                                |         |          |
| nt  | 1 013,90 | 1,64547 | Grindability   | HG       | HG3    | T 365                                | 0,325   |          |
| n1060,0   | 1 060,00 | 1,64452 | Knoop Hardness   | KH       | 410,00 | T 400                                | 0,892   |          |
| <u>Termal Properties</u>                          |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 2,40   | T 440                                | 0,973   |          |
| Transformation<br>Temperature, C                  | Tg       | 510     | <u>Temperature Coefficient of Refractive Index</u>     |          |        | T 550                                | 0,996   |          |
| Exspansion Coefficient,<br>10 <sup>-6</sup> /-7/C | Alpha    | 65      | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | 58     | T 640                                | 0,993   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 77     | Ta                                   | 0,996   |          |
|   |          |         |  |          |        | <u>Other Properties</u>              |         |          |
|   |          |         |  |          |        | Bubble                               | B       | 4        |
|   |          |         |  |          |        | Farbcode                             | FC      | 39\36    |
| <b>PG&amp;F, TM (UA)</b>                          |          |         | <b>85</b>  |          |        | <b>4 492 248 000</b>                 |         |          |



| DATA SHEET   |          |         | BF32   |          |       | 579 466                              |         |          |           |        |
|--|----------|---------|--|----------|-------|--------------------------------------|---------|----------|-----------|--------|
| Refractive Index                                   | nd       | 1,57941 | Abbe Number  | Vd       | 46,69 | Dispersion                           | nF-nC   | 0,012410 |           |        |
|  | ne       | 1,58236 |  | Ve       | 46,41 |                                      | nF'-nC' | 0,012549 |           |        |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                           |          |       | <u>Realative Partial Dispersions</u> |         |          |           |        |
| ni   | 365,00   | 1,61183 | nF-nC  | 0,012410 |       | Pe (i,h)                             | 0,8530  |          |           |        |
| nh   | 404,66   | 1,60113 | nF'-nC'  | 0,012549 |       | Pe (h,g)                             | 0,4781  |          |           |        |
| ng   | 435,83   | 1,59513 | <u>Deviation of Realative Partial Dispersions</u>    |          |       | Pe (g,F')                            | 0,5016  |          |           |        |
| nF'  | 479,99   | 1,58884 |  |          |       | delta Pe (i,F')                      | 0,0070  |          | Pe (F',e) | 0,5162 |
| n488,0   | 488,00   | 1,58789 | delta Pe (g,F')                                      | 0,0000   |       | Pe (e,d)                             | 0,2351  |          |           |        |
| ne   | 546,07   | 1,58236 | delta Pe (F',e)                                      | -0,0003  |       | Pe (d,C')                            | 0,2488  |          |           |        |
| nd   | 587,56   | 1,57941 | delta Pe (F',r)                                      | 0,0004   |       | Pe (e,C')                            | 0,4839  |          |           |        |
| n632,8   | 632,80   | 1,57684 | <u>Chemical Properties</u>                           |          |       | Pe (C,r)                             | 0,2130  |          |           |        |
| nC'  | 643,85   | 1,57629 |  |          |       | Water Resistance                     | WRs     | SG       | Pe (r,s)  | 0,3430 |
| n694,3   | 694,30   | 1,57409 | Acide Resistance                                     | AR*      | 6     | <u>Internal Transmittance</u>        |         |          |           |        |
| nr   | 706,52   | 1,57361 |  |          |       | 10 mm                                |         |          |           |        |
| ns   | 852,10   | 1,56931 |  |          |       | T 365                                |         |          | 0,833     |        |
| nt   | 1 013,90 | 1,56608 |  |          |       | T 400                                |         |          | 0,976     |        |
| n1060,0  | 1 060,00 | 1,56531 |  |          |       | T 440                                |         |          | 0,986     |        |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                         |          |       | T 550                                |         |          | 0,995     |        |
| Transformation Temperature, C                      | Tg       | 420     | Density, g/c.cm.                                     | SG       | 2,85  | T 640                                |         |          | 0,994     |        |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 114     | Grindability   | HG       | HG2   | Ta                                   |         |          | 0,995     |        |
|  |          |         | Knoop Hardness                                       | KH       | -     |                                      |         |          |           |        |
|  |          |         | Photoelastic Coefficient, nm/lcm 10 <sup>-5</sup> Pa | K        | 2,80  |                                      |         |          |           |        |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |  |          |       | <u>Other Properties</u>              |         |          |           |        |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs  | -64      |       | Bubble                               | B       | 5        |           |        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs  | -57      |       | Farbcode                             | FC      | 36\35    |           |        |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>41</b>  |          |       | <b>4 492 249 000</b>                 |         |          |           |        |

| DATA SHEET   |          |         | OF1   |          |       | 529 518                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,52949 | Abbe Number   | Vd       | 51,81 | Dispersion                          | nF-nC   | 0,010220 |
|  | ne       | 1,53192 |   | Ve       | 51,57 |                                     | nF'-nC' | 0,010315 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                            |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,55515 | nF-nC   | 0,010220 |       | Pe (i,h)                            | 0,7920  |          |
| nh   | 404,66   | 1,54698 | nF'-nC'   | 0,010315 |       | Pe (h,g)                            | 0,4585  |          |
| ng   | 435,83   | 1,54225 | <u>Deviation of Relative Partial Dispersions</u>      |          |       | Pe (g,F')                           | 0,4890  |          |
| nF'  | 479,99   | 1,53721 | delta Pe (i,F')                                       | -0,0380  |       | Pe (F',e)                           | 0,5122  |          |
| n488,0   | 488,00   | 1,53644 | delta Pe (g,F')                                       | -0,0049  |       | Pe (e,d)                            | 0,2358  |          |
| ne   | 546,07   | 1,53192 | delta Pe (F',e)                                       | -0,0013  |       | Pe (d,C')                           | 0,2520  |          |
| nd   | 587,56   | 1,52949 | delta Pe (F',r)                                       | 0,0019   |       | Pe (e,C')                           | 0,4878  |          |
| n632,8   | 632,80   | 1,52735 | <u>Chemical Properties</u>                            |          |       | Pe (C,r)                            | 0,2180  |          |
| nC'  | 643,85   | 1,52689 | Water Resistance                                      | WRs      | A     | Pe (r,s)                            | 0,3600  |          |
| n694,3   | 694,30   | 1,52504 | Acide Resistance                                      | AR*      | 6     | Pe (s,t)                            | 0,2790  |          |
| nr   | 706,52   | 1,52464 |   |          |       | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,52093 |   |          |       | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,51805 |   |          |       | T 365                               | 0,620   |          |
| n1060,0  | 1 060,00 | 1,51735 |   |          |       | T 400                               | 0,906   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                          |          |       | T 440                               | 0,971   |          |
| Transformation Temperature, C                      | Tg       | 455     | Density, g/c.cm.                                      | SG       | 2,56  | T 550                               | 0,995   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 62      | Grindability  | HG       | HG3   | T 640                               | 0,994   |          |
|  |          |         | Knoop Hardness  | KH       | -     | Ta                                  | 0,995   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>4</sup> -5 Pa | K        | 4,00  |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 13       |       | Bubble                              | B       | 3        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 31       |       | Farbcode                            | FC      | 39\36    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>24</b>   |          |       | <b>4 492 386 000</b>                |         |          |

| DATA SHEET   |          |         | OF3  |          |       | 612 440                              |         |          |           |        |
|--|----------|---------|--|----------|-------|--------------------------------------|---------|----------|-----------|--------|
| Refractive Index                                   | nd       | 1,61242 | Abbe Number  | Vd       | 44,09 | Dispersion                           | nF-nC   | 0,013890 |           |        |
|  | ne       | 1,61573 |  | Ve       | 43,88 |                                      | nF'-nC' | 0,014031 |           |        |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                           |          |       | <u>Realative Partial Dispersions</u> |         |          |           |        |
| ni   | 365,00   | 1,64803 | nF-nC  | 0,013890 |       | Pe (i,h)                             | 0,8220  |          |           |        |
| nh   | 404,66   | 1,63490 | nF'-nC'  | 0,014031 |       | Pe (h,g)                             | 0,4697  |          |           |        |
| ng   | 435,83   | 1,62990 | <u>Deviation of Realative Partial Dispersions</u>    |          |       | Pe (g,F')                            | 0,4957  |          |           |        |
| nF'  | 479,99   | 1,62294 |  |          |       | delta Pe (i,F')                      | -0,0610 |          | Pe (F',e) | 0,5140 |
| n488,0   | 488,00   | 1,62190 | delta Pe (g,F')                                      | -0,0096  |       | Pe (e,d)                             | 0,2360  |          |           |        |
| ne   | 546,07   | 1,61573 | delta Pe (F',e)                                      | -0,0039  |       | Pe (d,C')                            | 0,2501  |          |           |        |
| nd   | 587,56   | 1,61242 | delta Pe (F',r)                                      | 0,0053   |       | Pe (e,C')                            | 0,4860  |          |           |        |
| n632,8   | 632,80   | 1,60953 | <u>Chemical Properties</u>                           |          |       | Pe (C,r)                             | 0,2160  |          |           |        |
| nC'  | 643,85   | 1,60891 |  |          |       | Water Resistance                     | WRs     | d        | Pe (r,s)  | 0,3540 |
| n694,3   | 694,30   | 1,60642 | Acide Resistance                                     | AR*      | 6     | <u>Internal Transmittance</u>        |         |          |           |        |
| nr   | 706,52   | 1,60588 |  |          |       | 10 mm                                |         |          |           |        |
| ns   | 852,10   | 1,60092 |  |          |       | T 365                                |         |          | 0,852     |        |
| nt   | 1 013,90 | 1,59712 |  |          |       | T 400                                |         |          | 0,966     |        |
| n1060,0  | 1 060,00 | 1,59620 |  |          |       | T 440                                |         |          | 0,990     |        |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                         |          |       | T 550                                |         |          | 0,995     |        |
| Transformation Temperature, C                      | Tg       | 455     | Density, g/c.cm.                                     | SG       | 3,15  | T 640                                |         |          | 0,995     |        |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 56      | Grindability   | HG       | HG2   | Ta                                   |         |          | 0,995     |        |
|  |          |         | Knoop Hardness                                       | KH       | -     |                                      |         |          |           |        |
|  |          |         | Photoelastic Coefficient, nm/lcm 10 <sup>-5</sup> Pa | K        | 3,20  |                                      |         |          |           |        |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |  |          |       | <u>Other Properties</u>              |         |          |           |        |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs  | 8        |       | Bubble                               |         |          | B         | 4      |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs  | 25       |       | Farbcode                             |         |          | FC        | 36\34  |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>58</b>  |          |       | <b>4 492 389 000</b>                 |         |          |           |        |

| DATA SHEET   |          |         | OF4   |          |       | 650 434                              |         |          |
|--|----------|---------|---|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,65063 | Abbe Number   | Vd       | 43,46 | Dispersion                           | nF-nC   | 0,014970 |
|  | ne       | 1,65419 |   | Ve       | 43,25 |                                      | nF'-nC' | 0,015127 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,68919 | nF-nC   | 0,014970 |       | Pe (i,h)                             | 0,8300  |          |
| nh   | 404,66   | 1,67664 | nF'-nC'   | 0,015127 |       | Pe (h,g)                             | 0,4716  |          |
| ng   | 435,83   | 1,66951 | <u>Deviation of Realative Partial Dispersions</u>   |          |       | Pe (g,F')                            | 0,4978  |          |
| nF'  | 479,99   | 1,66197 | delta Pe (i,F')                                     | -0,0560  |       | Pe (F',e)                            | 0,5147  |          |
| n488,0   | 488,00   | 1,66085 | delta Pe (g,F')                                     | -0,0084  |       | Pe (e,d)                             | 0,2352  |          |
| ne   | 546,07   | 1,65419 | delta Pe (F',e)                                     | -0,0036  |       | Pe (d,C')                            | 0,2502  |          |
| nd   | 587,56   | 1,65063 | delta Pe (F',r)                                     | 0,0043   |       | Pe (e,C')                            | 0,4853  |          |
| n632,8   | 632,80   | 1,64751 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                             | 0,2150  |          |
| nC'  | 643,85   | 1,64685 | Water Resistance                                    | WRs      | d     | Pe (r,s)                             | 0,3510  |          |
| n694,3   | 694,30   | 1,64417 | Acide Resistance                                    | AR*      | 6     | Pe (s,t)                             | 0,2670  |          |
| nr   | 706,52   | 1,64360 |   |          |       | <u>Internal Transmittance</u>        |         |          |
| ns   | 852,10   | 1,63829 |   |          |       | 10 mm                                |         |          |
| nt   | 1 013,90 | 1,63425 |   |          |       | T 365                                | 0,813   |          |
| n1060,0  | 1 060,00 | 1,63329 |   |          |       | T 400                                | 0,927   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |       | T 440                                | 0,986   |          |
| Transformation Temperature, C                      | Tg       | 500     | Density, g/c.cm.                                    | SG       | 3,48  | T 550                                | 0,997   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 52      | Grindability  | HG       | HG3   | T 640                                | 0,996   |          |
|  |          |         | Knoop Hardness                                      | KH       | -     | Ta                                   | 0,997   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,00  |                                      |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>              |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 16       |       | Bubble                               | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 31       |       | Farbcode                             | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>80</b>   |          |       | <b>4 492 390 000</b>                 |         |          |

| DATA SHEET                                  |          |         | OF5   |          |       | 662 417                             |         |          |
|---|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                            | nd       | 1,66264 | Abbe Number   | Vd       | 41,78 | Dispersion                          | nF-nC   | 0,015860 |
|   | ne       | 1,66640 |   | Ve       | 41,56 |                                     | nF'-nC' | 0,016033 |
| <u>Refractive Indices</u>                   |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,70381 | nF-nC   | 0,015860 |       | Pe (i,h)                            | 0,8410  |          |
| nh  | 404,66   | 1,69033 | nF'-nC'   | 0,016033 |       | Pe (h,g)                            | 0,4756  |          |
| ng  | 435,83   | 1,68270 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,5007  |          |
| nF'   | 479,99   | 1,67468 | delta Pe (i,F')                                     | -0,0530  |       | Pe (F',e)                           | 0,5159  |          |
| n488,0                                      | 488,00   | 1,67348 | delta Pe (g,F')                                     | -0,0080  |       | Pe (e,d)                            | 0,2349  |          |
| ne  | 546,07   | 1,66640 | delta Pe (F',e)                                     | -0,0033  |       | Pe (d,C')                           | 0,2492  |          |
| nd  | 587,56   | 1,66264 | delta Pe (F',r)                                     | 0,0050   |       | Pe (e,C')                           | 0,4841  |          |
| n632,8                                      | 632,80   | 1,65934 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2140  |          |
| nC'   | 643,85   | 1,65864 | Water Resistance                                    | WRs      | d     | Pe (r,s)                            | 0,3480  |          |
| n694,3                                      | 694,30   | 1,65581 | Acide Resistance                                    | AR*      | 6     | Pe (s,t)                            | 0,2640  |          |
| nr  | 706,52   | 1,65521 | <u>Mechanical Properties</u>                        |          |       | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,64963 | Density, g/cm.                                      | SG       | 3,60  | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,64539 | Grindability  | HG       | HG2   | T 365                               | 0,684   |          |
| n1060,0                                     | 1 060,00 | 1,64437 | Knoop Hardness                                      | KH       | -     | T 400                               | 0,940   |          |
| <u>Termal Properties</u>                    |          |         | Photoelastic Coefficient, nm/cm 10 <sup>-5</sup> Pa | K        | 2,50  | T 440                               | 0,986   |          |
| Transformation Temperature, C               | Tg       | 480     | <u>Temperature Coefficient of Refractive Index</u>  |          |       | T 550                               | 0,996   |          |
| Exspansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 53      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | 13    | T 640                               | 0,996   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 27    | Ta                                  | 0,996   |          |
|   |          |         |   |          |       | <u>Other Properties</u>             |         |          |
|   |          |         |   |          |       | Bubble                              | B       | 4        |
|   |          |         |   |          |       | Farbcode                            | FC      | 38\35    |
| <b>PG&amp;F, TM (UA)</b>                    |          |         | <b>84</b>   |          |       | <b>4 492 391 000</b>                |         |          |

| DATA SHEET   |          |         | OF6  |          |       | 601 510                                       |         |          |                         |        |
|--|----------|---------|--|----------|-------|---|---------|----------|-------------------------|--------|
| Refractive Index                                   | nd       | 1,60121 | Abbe Number  | Vd       | 51,04 | Dispersion                                    | nF-nC   | 0,011780 |                         |        |
|  | ne       | 1,60401 |  | Ve       | 50,84 |   | nF'-nC' | 0,011880 |                         |        |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Realative Partial Dispersions</u>          |         |          |                         |        |
| ni   | 365,00   | 1,63061 | nF-nC  | 0,011780 |       | Pe (i,h)                                      | 0,7880  |          |                         |        |
| nh   | 404,66   | 1,62125 | nF'-nC'  | 0,011880 |       | Pe (h,g)                                      | 0,4549  |          |                         |        |
| ng   | 435,83   | 1,61585 | <u>Deviation of Realative Partial Dispersions</u>      |          |       | Pe (g,F')                                     | 0,4861  |          |                         |        |
| nF'  | 479,99   | 1,61007 |  |          |       | delta Pe (i,F')                               | -0,0550 |          | Pe (F',e)               | 0,5101 |
| n488,0   | 488,00   | 1,60920 | delta Pe (g,F')  | -0,0088  |       | Pe (e,d)                                      | 0,2361  |          |                         |        |
| ne   | 546,07   | 1,60401 | delta Pe (F',e)  | -0,0038  |       | Pe (d,C')                                     | 0,2538  |          |                         |        |
| nd   | 587,56   | 1,60121 | delta Pe (F',r)  | 0,0038   |       | Pe (e,C')                                     | 0,4899  |          |                         |        |
| n632,8   | 632,80   | 1,59872 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                                      | 0,2210  |          |                         |        |
| nC'  | 643,85   | 1,59819 |  |          |       | Water Resistance                              | WRs     | SG       | Pe (r,s)                | 0,3700 |
| n694,3   | 694,30   | 1,59602 | Acide Resistance                                       | AR*      | 6     | <u>Internal Transmittance</u>                 |         |          |                         |        |
| nr   | 706,52   | 1,59556 | <u>Mechanical Properties</u>                           |          |       | 10 mm   |         |          |                         |        |
| ns   | 852,10   | 1,59116 |  |          |       | Density, g\c.cm.                              | SG      | 2,95     | T 365                   | 0,828  |
| nt   | 1 013,90 | 1,58765 | Grindability   | HG       | HG3   | T 400   | 0,967   |          |                         |        |
| n1060,0  | 1 060,00 | 1,58679 | Knoop Hardness   | KH       | -     | T 440   | 0,989   |          |                         |        |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 3,00  | T 550   | 0,996   |          |                         |        |
| Transformation<br>Temperature, C                   | Tg       | 540     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 640   | 0,995   |          |                         |        |
| Exspansion<br>Coefficient, 10 <sup>-7</sup> /C     | Alpha    | 48      |  |          |       | Range of Temperature, C: - 60 ... 20, C'-Line |         |          | Ta                      | 0,996  |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | Range of Temperature, C: 20 ... 120, C'-Line           |          |       |   |         |          | <u>Other Properties</u> |        |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         |  |          |       | NTabs   |         |          | 13                      |        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs  |          |       | 29  |         | Farbcode | FC                      | 36\34  |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>50</b>  |          |       | <b>4 492 392 000</b>                          |         |          |                         |        |

| DATA SHEET   |          |         | OF7   |          |           | 600 477                              |         |          |  |
|--|----------|---------|---|----------|-----------|--------------------------------------|---------|----------|--|
| Refractive Index                                   | nd       | 1,60021 | Abbe Number   | Vd       | 47,71     | Dispersion                           | nF-nC   | 0,012580 |  |
|  | ne       | 1,60320 |   | Ve       | 47,48     |                                      | nF'-nC' | 0,012704 |  |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Realative Partial Dispersions</u> |         |          |  |
| ni   | 365,00   | 1,63223 | nF-nC   | 0,012580 | Pe (i,h)  | 0,8140                               |         |          |  |
| nh   | 404,66   | 1,62189 | nF'-nC'   | 0,012704 | Pe (h,g)  | 0,4648                               |         |          |  |
| ng   | 435,83   | 1,61598 | <u>Deviation of Realative Partial Dispersions</u>   |          |           | Pe (g,F')                            | 0,4928  |          |  |
| nF'  | 479,99   | 1,60972 | delta Pe (i,F')                                     | -0,0430  | Pe (F',e) | 0,5131                               |         |          |  |
| n488,0   | 488,00   | 1,60878 | delta Pe (g,F')                                     | -0,0071  | Pe (e,d)  | 0,2356                               |         |          |  |
| ne   | 546,07   | 1,60320 | delta Pe (F',e)                                     | -0,0027  | Pe (d,C') | 0,2513                               |         |          |  |
| nd   | 587,56   | 1,60021 | delta Pe (F',r)                                     | 0,0035   | Pe (e,C') | 0,4869                               |         |          |  |
| n632,8   | 632,80   | 1,59758 | <u>Chemical Properties</u>                          |          |           | Pe (C,r)                             | 0,2170  |          |  |
| nC'  | 643,85   | 1,59702 | Water Resistance                                    | WRs      | s         | Pe (r,s)                             | 0,3570  |          |  |
| n694,3   | 694,30   | 1,59475 | Acide Resistance                                    | AR*      | 4         | Pe (s,t)                             | 0,2770  |          |  |
| nr   | 706,52   | 1,59426 |   |          |           | <u>Internal Transmittance</u>        |         |          |  |
| ns   | 852,10   | 1,58973 |   |          |           | 10 mm                                |         |          |  |
| nt   | 1 013,90 | 1,58621 |   |          |           | T 365                                | 0,813   |          |  |
| n1060,0  | 1 060,00 | 1,58536 |   |          |           | T 400                                | 0,966   |          |  |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                                | 0,989   |          |  |
| Transformation Temperature, C                      | Tg       | 545     | Density, g/c.cm.                                    | SG       | 3,05      | T 550                                | 0,995   |          |  |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 44      | Grindability  | HG       | HG4       | T 640                                | 0,997   |          |  |
|  |          |         | Knoop Hardness                                      | KH       | -         | Ta                                   | 0,995   |          |  |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 3,05      |                                      |         |          |  |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |           | <u>Other Properties</u>              |         |          |  |
| Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    | 45      |   |          |           | Bubble                               | B       | 4        |  |
| Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    | 57      |   |          |           | Farbcode                             | FC      | 36\34    |  |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>49</b>   |          |           | <b>4 492 393 000</b>                 |         |          |  |

| DATA SHEET   |          |         | OF8   |          |           | 651 431                             |         |          |
|--|----------|---------|---|----------|-----------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,65113 | Abbe Number   | Vd       | 43,18     | Dispersion                          | nF-nC   | 0,015080 |
|  | ne       | 1,65471 |   | Ve       | 42,95     |                                     | nF'-nC' | 0,015245 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | -       | nF-nC   | 0,015080 | Pe (i,h)  | -                                   |         |          |
| nh   | 404,66   | 1,67750 | nF'-nC'   | 0,015245 | Pe (h,g)  | 0,4771                              |         |          |
| ng   | 435,83   | 1,67023 |   |          | Pe (g,F') | 0,5013                              |         |          |
| nF'  | 479,99   | 1,66258 | <u>Deviation of Relative Partial Dispersions</u>    |          |           | Pe (F',e)                           | 0,5162  |          |
| n488,0   | 488,00   | 1,66144 | delta Pe (i,F')                                     | -        | Pe (e,d)  | 0,2350                              |         |          |
| ne   | 546,07   | 1,65471 | delta Pe (g,F')                                     | -0,0054  | Pe (d,C') | 0,2487                              |         |          |
| nd   | 587,56   | 1,65113 | delta Pe (F',e)                                     | -0,0022  | Pe (e,C') | 0,4837                              |         |          |
| n632,8   | 632,80   | 1,64800 | delta Pe (F',r)                                     | 0,0027   | Pe (C,r)  | 0,2130                              |         |          |
| nC'  | 643,85   | 1,64734 | <u>Chemical Properties</u>                          |          |           | Pe (r,s)                            | 0,3440  |          |
| n694,3   | 694,30   | 1,64466 | Water Resistance                                    | WRs      | s         | Pe (s,t)                            | 0,2600  |          |
| nr   | 706,52   | 1,64409 | Acide Resistance                                    | AR*      | 4         | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,63884 |   |          |           |                                     | 10 mm   |          |
| nt   | 1 013,90 | 1,63488 |   |          |           | T 365                               | 0,631   |          |
| n1060,0  | 1 060,00 | 1,63394 |   |          |           | T 400                               | 0,931   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                               | 0,986   |          |
| Transformation Temperature, C                      | Tg       | 535     | Density, g\c.cm.                                    | SG       | 3,53      | T 550                               | 0,995   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 49      | Grindability  | HG       | HG3       | T 640                               | 0,003   |          |
|  |          |         | Knoop Hardness                                      | KH       | -         | Ta                                  | 0,995   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,25      |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |           | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 57       |           | Bubble                              | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 69       |           | Farbcode                            | FC      | 38\36    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>81</b>   |          |           | <b>4 492 394 000</b>                |         |          |



| DATA SHEET                                 |          |         | OF9  |          |       | 720 352                              |         |          |
|--|----------|---------|--|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                           | nd       | 1,72098 | Abbe Number  | Vd       | 35,26 | Dispersion                           | nF-nC   | 0,020450 |
|  | ne       | 1,72582 |  | Ve       | 35,02 |                                      | nF'-nC' | 0,020727 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                         |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | -       | nF-nC  | 0,020450 |       | Pe (i,h)                             | -       |          |
| nh   | 404,66   | 1,75764 | nF'-nC'  | 0,020727 |       | Pe (h,g)                             | 0,4980  |          |
| ng   | 435,83   | 1,74732 | <u>Deviation of Realative Partial Dispersions</u>  |          |       | Pe (g,F')                            | 0,5154  |          |
| nF'  | 479,99   | 1,73664 |  |          |       | delta Pe (i,F')                      | -       |          |
| n488,0                                     | 488,00   | 1,73505 | delta Pe (g,F')                                    | -0,0030  |       | Pe (e,d)                             | 0,2339  |          |
| ne   | 546,07   | 1,72582 | delta Pe (F',e)                                    | -0,0014  |       | Pe (d,C')                            | 0,2445  |          |
| nd   | 587,56   | 1,72098 | delta Pe (F',r)                                    | 0,0015   |       | Pe (e,C')                            | 0,4785  |          |
| n632,8                                     | 632,80   | 1,71679 | <u>Chemical Properties</u>                         |          |       | Pe (C,r)                             | 0,2060  |          |
| nC'  | 643,85   | 1,71591 |  |          |       | Water Resistance                     | WRs     | s        |
| n694,3                                     | 694,30   | 1,71239 | Acide Resistance                                   | AR*      | 6     | Pe (s,t)                             | 0,2330  |          |
| nr   | 706,52   | 1,71163 | <u>Mechanical Properties</u>                       |          |       | <u>Internal Transmittance</u>        |         |          |
| ns   | 852,10   | 1,70493 |  |          |       | Density, g/c.cm.                     | SG      | 4,16     |
| nt   | 1 013,90 | 1,70011 | Grindability                                       | HG       | HG3   | T 365                                | 0,234   |          |
| n1060,0                                    | 1 060,00 | 1,69901 | Knoop Hardness                                     | KH       | -     | T 400                                | 0,974   |          |
| <u>Termal Properties</u>                   |          |         | Photoelastic Coefficient, nm\cm                    | K        | 1,65  | T 440                                | 0,977   |          |
| Transformation Temperature, C              | Tg       | 500     | 10 <sup>-5</sup> Pa                                |          |       |                                      |         |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 57      | <u>Temperature Coefficient of Refractive Index</u> |          |       | <u>Other Properties</u>              |         |          |
|  |          |         | Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    | -     | Bubble                               | B       | 4        |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    | 67    | Farbcode                             | FC      | 39\38    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>95</b>  |          |       | <b>4 492 395 000</b>                 |         |          |

| DATA SHEET   |          |         | LF5   |          |       | 575 413                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,57502 | Abbe Number   | Vd       | 41,31 | Dispersion                          | nF-nC   | 0,013920 |
|  | ne       | 1,57833 |   | Ve       | 41,03 |                                     | nF'-nC' | 0,014094 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,61197 | nF-nC   | 0,013920 |       | Pe (i,h)                            | 0,8720  |          |
| nh   | 404,66   | 1,59968 | nF'-nC'   | 0,014094 |       | Pe (h,g)                            | 0,4875  |          |
| ng   | 435,83   | 1,59281 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,5088  |          |
| nF'  | 479,99   | 1,58564 |   |          |       | delta Pe (i,F')                     | -0,0070 |          |
| n488,0   | 488,00   | 1,58457 | delta Pe (g,F')                                     | -0,0007  |       | Pe (e,d)                            | 0,2344  |          |
| ne   | 546,07   | 1,57833 | delta Pe (F',e)                                     | -0,0007  |       | Pe (d,C')                           | 0,2468  |          |
| nd   | 587,56   | 1,57502 | delta Pe (F',r)                                     | 0,0000   |       | Pe (e,C')                           | 0,4812  |          |
| n632,8   | 632,80   | 1,57215 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2090  |          |
| nC'  | 643,85   | 1,57154 |   |          |       | Water Resistance                    | WRs     | A        |
| n694,3   | 694,30   | 1,56912 | Acide Resistance                                    | AR*      | 1     | <u>Internal Transmittance</u>       |         |          |
| nr   | 706,52   | 1,56860 |   |          |       | 10 mm                               |         |          |
| ns   | 852,10   | 1,56393 |   |          |       | T 365                               | 0,920   |          |
| nt   | 1 013,90 | 1,56056 | T 400   | 0,987    |       |                                     |         |          |
| n1060,0  | 1 060,00 | 1,55979 | T 440   | 0,989    |       |                                     |         |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |       | T 550                               | 0,995   |          |
| Transformation Temperature, C                      | Tg       | 470     | Density, g/c.cm.                                    | SG       | 3,23  | T 640                               | 0,993   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 71      | Grindability  | HG       | HG3   | Ta                                  | 0,995   |          |
|  |          |         | Knoop Hardness                                      | KH       | -     |                                     |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 3,25  |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    | 20      |   |          |       | Bubble                              | B       | 3        |
| Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    | 38      |   |          |       | Farbcode                            | FC      | 35\33    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>39</b>   |          |       | <b>4 492 296 000</b>                |         |          |

| DATA SHEET   |          |         | LF7  |          |       | 578 411                             |         |          |
|--|----------|---------|--|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,57842 | Abbe Number  | Vd       | 41,11 | Dispersion                          | nF-nC   | 0,014070 |
|  | ne       | 1,58176 |  | Ve       | 40,83 |                                     | nF'-nC' | 0,014247 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,61581 | nF-nC  | 0,014070 |       | Pe (i,h)                            | 0,8740  |          |
| nh   | 404,66   | 1,60336 | nF'-nC'  | 0,014247 |       | Pe (h,g)                            | 0,4878  |          |
| ng   | 435,83   | 1,59641 | <u>Deviation of Realative Partial Dispersions</u>      |          |       | Pe (g,F')                           | 0,5091  |          |
| nF'  | 479,99   | 1,58916 |  |          |       | delta Pe (i,F')                     | -0,0060 |          |
| n488,0   | 488,00   | 1,58808 | delta Pe (g,F')  | -0,0008  |       | Pe (e,d)                            | 0,2340  |          |
| ne   | 546,07   | 1,58176 | delta Pe (F',e)  | -0,0001  |       | Pe (d,C')                           | 0,2466  |          |
| nd   | 587,56   | 1,57842 | delta Pe (F',r)  | -0,0002  |       | Pe (e,C')                           | 0,4806  |          |
| n632,8   | 632,80   | 1,57552 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                            | 0,2080  |          |
| nC'  | 643,85   | 1,57491 |  |          |       | Water Resistance                    | WRs     | B        |
| n694,3   | 694,30   | 1,57246 | Acide Resistance                                       | AR*      | 1     | <u>Internal Transmittance</u>       |         |          |
| nr   | 706,52   | 1,57194 |  |          |       | 10 mm                               |         |          |
| ns   | 852,10   | 1,56723 |  |          |       | T 365                               | 0,964   |          |
| nt   | 1 013,90 | 1,56383 | T 400  | 0,988    |       |                                     |         |          |
| n1060,0  | 1 060,00 | 1,56305 | T 440  | 0,992    |       |                                     |         |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                           |          |       | T 550                               | 0,995   |          |
|  |          |         |  |          |       | T 640                               | 0,994   |          |
| Transformation<br>Temperature, C                   | Tg       | 475     | Density, g/c.cm.                                       | SG       | 3,23  | Ta                                  | 0,995   |          |
| Expansion<br>Coefficient, 10 <sup>-7</sup> /C      | Alpha    | 75      | Grindability   | HG       | HG3   |                                     |         |          |
|  |          |         | Knoop Hardness   | KH       | -     |                                     |         |          |
|  |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 3,25  |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |  |          |       | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs  | 19       |       | Bubble                              | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs  | 39       |       | Farbcode                            | FC      | 35\33    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>40</b>  |          |       | <b>4 492 298 000</b>                |         |          |

| DATA SHEET   |          |         | LF9  |          |       | 580 380                                       |         |          |
|--|----------|---------|--|----------|-------|---|---------|----------|
| Refractive Index                                   | nd       | 1,58013 | Abbe Number  | Vd       | 38,02 | Dispersion                                    | nF-nC   | 0,015260 |
|  | ne       | 1,58374 |  | Ve       | 37,73 |   | nF'-nC' | 0,015471 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Relative Partial Dispersions</u>           |         |          |
| ni   | 365,00   | 1,62237 | nF-nC  | 0,015260 |       | Pe (i,h)                                      | 0,9460  |          |
| nh   | 404,66   | 1,60773 | nF'-nC'  | 0,015471 |       | Pe (h,g)                                      | 0,5090  |          |
| ng   | 435,83   | 1,59986 | <u>Deviation of Realative Partial Dispersions</u>      |          |       | Pe (g,F')                                     | 0,5192  |          |
| nF'  | 479,99   | 1,59182 |  |          |       | delta Pe (i,F')                               | 0,0680  |          |
| n488,0   | 488,00   | 1,59064 | delta Pe (g,F')  | 0,0048   |       | Pe (e,d)                                      | 0,2332  |          |
| ne   | 546,07   | 1,58374 | delta Pe (F',e)  | 0,0009   |       | Pe (d,C')                                     | 0,2445  |          |
| nd   | 587,56   | 1,58013 | delta Pe (F',r)  | -0,0001  |       | Pe (e,C')                                     | 0,4777  |          |
| n632,8   | 632,80   | 1,57701 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                                      | 0,2060  |          |
| nC'  | 643,85   | 1,57635 |  |          |       | Water Resistance                              | WRs     | A        |
| n694,3   | 694,30   | 1,57372 | Acide Resistance                                       | AR*      | 1     | <u>Internal Transmittance</u>                 |         |          |
| nr   | 706,52   | 1,57316 | <u>Mechanical Properties</u>                           |          |       | 10 mm   |         |          |
| ns   | 852,10   | 1,56813 |  |          |       | Density, g/c.cm.                              | SG      | 2,61     |
| nt   | 1 013,90 | 1,56448 | Grindability   | HG       | HG3   | T 400   | 0,930   |          |
| n1060,0  | 1 060,00 | 1,56364 | Knoop Hardness   | KH       | -     | T 440   | 0,970   |          |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 3,60  | T 550   | 0,993   |          |
| Transformation<br>Temperature, C                   | Tg       | 485     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 640   | 0,992   |          |
| Expansion<br>Coefficient, 10 <sup>-7</sup> /C      | Alpha    | 90      |  |          |       | Range of Temperature, C: - 60 ... 20, C'-Line | NTabs   | -16      |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | -1    | <u>Other Properties</u>                       |         |          |
|  |          |         |  |          |       | Bubble  | B       | 4        |
|  |          |         |  |          |       | Farbcode                                      | FC      | 37\36    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>45</b>  |          |       | <b>4 492 300 000</b>                          |         |          |

| DATA SHEET   |          |         | LF10  |          |       | 548 458                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,54810 | Abbe Number   | Vd       | 45,87 | Dispersion                          | nF-nC   | 0,011950 |
|  | ne       | 1,55094 |   | Ve       | 45,58 |                                     | nF'-nC' | 0,012087 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,57931 | nF-nC   | 0,011950 |       | Pe (i,h)                            | 0,8440  |          |
| nh   | 404,66   | 1,56911 | nF'-nC'   | 0,012087 |       | Pe (h,g)                            | 0,4820  |          |
| ng   | 435,83   | 1,56328 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,5044  |          |
| nF'  | 479,99   | 1,55719 |   |          |       | delta Pe (i,F')                     | -0,0030 |          |
| n488,0   | 488,00   | 1,55628 | delta Pe (g,F')                                     | 0,0016   |       | Pe (e,d)                            | 0,2346  |          |
| ne   | 546,07   | 1,55094 | delta Pe (F',e)                                     | 0,0000   |       | Pe (d,C')                           | 0,2486  |          |
| nd   | 587,56   | 1,54810 | delta Pe (F',r)                                     | -0,0003  |       | Pe (e,C')                           | 0,4832  |          |
| n632,8   | 632,80   | 1,54563 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2120  |          |
| nC'  | 643,85   | 1,54510 |   |          |       | Water Resistance                    | WRs     | A        |
| n694,3   | 694,30   | 1,54299 | Acide Resistance                                    | AR*      | 1     | Pe (s,t)                            | 0,2530  |          |
| nr   | 706,52   | 1,54254 | <u>Internal Transmittance</u>                       |          |       | 10 mm                               |         |          |
| ns   | 852,10   | 1,53842 |   |          |       | T 365                               | 0,492   |          |
| nt   | 1 013,90 | 1,53536 | T 400   | 0,949    |       |                                     |         |          |
| n1060,0  | 1 060,00 | 1,53464 | T 440   | 0,981    |       |                                     |         |          |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |       | T 550                               | 0,992   |          |
| Transformation Temperature, C                      | Tg       | 475     | Density, g\c.cm.                                    | SG       | 2,73  | T 640                               | 0,990   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 78      | Grindability  | HG       | HG3   | Ta                                  | 0,992   |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | Knoop Hardness                                      | KH       | -     | <u>Other Properties</u>             |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 3,00  |                                     |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    | 4       | <u>Temperature Coefficient of Refractive Index</u>  |          |       | Bubble                              | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    | 22      |   |          |       | Farbcode                            | FC      | 39\36    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>30</b>   |          |       | <b>4 492 301 000</b>                |         |          |

| DATA SHEET                                    |          |         | LF11   |          |       | 560 467                                       |         |          |
|---|----------|---------|--|----------|-------|---|---------|----------|
| Refractive Index                              | nd       | 1,56091 | Abbe Number  | Vd       | 46,78 | Dispersion                                    | nF-nC   | 0,011990 |
|   | ne       | 1,56376 |  | Ve       | 46,50 |   | nF'-nC' | 0,012123 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Realative Partial Dispersions</u>          |         |          |
| ni  | 365,00   | 1,59209 | nF-nC  | 0,011990 |       | Pe (i,h)                                      | 0,8440  |          |
| nh  | 404,66   | 1,58186 | nF'-nC'  | 0,012123 |       | Pe (h,g)                                      | 0,4766  |          |
| ng  | 435,83   | 1,57608 | <u>Deviation of Realative Partial Dispersions</u>      |          |       | Pe (g,F')                                     | 0,5006  |          |
| nF'   | 479,99   | 1,57001 |  |          |       | delta Pe (i,F')                               | -0,0030 |          |
| n488,0  | 488,00   | 1,56911 | delta Pe (g,F')  | -0,0008  |       | Pe (e,d)                                      | 0,2351  |          |
| ne  | 546,07   | 1,56376 | delta Pe (F',e)  | -0,0003  |       | Pe (d,C')                                     | 0,2489  |          |
| nd  | 587,56   | 1,56091 | delta Pe (F',r)  | 0,0001   |       | Pe (e,C')                                     | 0,4840  |          |
| n632,8  | 632,80   | 1,55842 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                                      | 0,2130  |          |
| nC'   | 643,85   | 1,55789 |  |          |       | Water Resistance                              | WRs     | A        |
| n694,3  | 694,30   | 1,55576 | Acide Resistance                                       | AR*      | 1     | Pe (s,t)                                      | 0,2570  |          |
| nr  | 706,52   | 1,55531 | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>                 |         |          |
| ns  | 852,10   | 1,55114 |  |          |       | Density, g/c.cm.                              | SG      | 3,02     |
| nt  | 1 013,90 | 1,54802 | Grindability   | HG       | HG3   | T 365   | 0,950   |          |
| n1060,0                                       | 1 060,00 | 1,54728 | Knoop Hardness   | KH       | -     | T 400   | 0,990   |          |
| <u>Termal Properties</u>                      |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 3,05  | T 440   | 0,991   |          |
| Transformation<br>Temperature, C              | Tg       | 530     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550   | 0,995   |          |
| Expansion<br>Coefficient, 10 <sup>-7</sup> /C | Alpha    | 74      |  |          |       | Range of Temperature, C: - 60 ... 20, C'-Line | NTabs   | 9        |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 28    | Ta  | 0,995   |          |
|   |          |         | <u>Other Properties</u>                                |          |       | Bubble  | B       | 3        |
|   |          |         |  |          |       | Farbcode                                      | FC      | 35\33    |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>34</b>  |          |       | <b>4 492 302 000</b>                          |         |          |

| DATA SHEET   |          |         | LF12   |          |       | 540 448                             |         |          |
|--|----------|---------|--|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,54021 | Abbe Number  | Vd       | 44,87 | Dispersion                          | nF-nC   | 0,012040 |
|  | ne       | 1,54306 |  | Ve       | 44,57 |                                     | nF'-nC' | 0,012185 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,57233 | nF-nC  | 0,012040 |       | Pe (i,h)                            | 0,8880  |          |
| nh   | 404,66   | 1,56151 | nF'-nC'  | 0,012185 |       | Pe (h,g)                            | 0,4875  |          |
| ng   | 435,83   | 1,55557 | <u>Deviation of Relative Partial Dispersions</u>       |          |       | Pe (g,F')                           | 0,5085  |          |
| nF'  | 479,99   | 1,54937 |  |          |       | delta Pe (i,F')                     | 0,0420  |          |
| n488,0   | 488,00   | 1,54845 | delta Pe (g,F')  | 0,0042   |       | Pe (e,d)                            | 0,2343  |          |
| ne   | 546,07   | 1,54306 | delta Pe (F',e)  | 0,0004   |       | Pe (d,C')                           | 0,2478  |          |
| nd   | 587,56   | 1,54021 | delta Pe (F',r)  | -0,0006  |       | Pe (e,C')                           | 0,4820  |          |
| n632,8   | 632,80   | 1,53772 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                            | 0,2110  |          |
| nC'  | 643,85   | 1,53719 |  |          |       | Water Resistance                    | WRs     | A        |
| n694,3   | 694,30   | 1,53507 | Acide Resistance                                       | AR*      | 1     | <u>Internal Transmittance</u>       |         |          |
| nr   | 706,52   | 1,53462 | <u>Mechanical Properties</u>                           |          |       | 10 mm                               |         |          |
| ns   | 852,10   | 1,53050 |  |          |       | Density, g/c.cm.                    | SG      | 2,54     |
| nt   | 1 013,90 | 1,52743 | Grindability   | HG       | HG3   | T 400                               | 0,968   |          |
| n1060,0  | 1 060,00 | 1,52671 | Knoop Hardness   | KH       | -     | T 440                               | 0,987   |          |
| <u>Thermal Properties</u>                          |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 3,15  | T 550                               | 0,995   |          |
| Transformation<br>Temperature, C                   | Tg       | 490     | <u>Other Properties</u>                                |          |       | T 640                               | 0,995   |          |
| Expansion<br>Coefficient, 10 <sup>-7</sup> /C      | Alpha    | 91      |  |          |       | Bubble                              | B       | 4        |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | NTabs  |          |       | Farbcode                            | FC      | 38\36    |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         |  |          |       | -22                                 |         |          |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | -7   |          |       |                                     |         |          |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>28</b>  |          |       | <b>4 492 304 000</b>                |         |          |

| DATA SHEET   |          |         | F1   |          |       | 612 369                             |         |          |           |        |
|--|----------|---------|--|----------|-------|-------------------------------------|---------|----------|-----------|--------|
| Refractive Index                                   | nd       | 1,61294 | Abbe Number  | Vd       | 36,95 | Dispersion                          | nF-nC   | 0,016590 |           |        |
|  | ne       | 1,61688 |  | Ve       | 36,69 |                                     | nF'-nC' | 0,016814 |           |        |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                           |          |       | <u>Relative Partial Dispersions</u> |         |          |           |        |
| ni   | 365,00   | 1,65782 | nF-nC  | 0,016590 |       | Pe (i,h)                            | 0,9000  |          |           |        |
| nh   | 404,66   | 1,64269 | nF'-nC'  | 0,016814 |       | Pe (h,g)                            | 0,4983  |          |           |        |
| ng   | 435,83   | 1,63431 | <u>Deviation of Relative Partial Dispersions</u>     |          |       | Pe (g,F')                           | 0,5153  |          |           |        |
| nF'  | 479,99   | 1,62565 |  |          |       | delta Pe (i,F')                     | -0,0020 |          | Pe (F',e) | 0,5215 |
| n488,0   | 488,00   | 1,62436 | delta Pe (g,F')                                      | -0,0006  |       | Pe (e,d)                            | 0,2339  |          |           |        |
| ne   | 546,07   | 1,61688 | delta Pe (F',e)                                      | -0,0005  |       | Pe (d,C')                           | 0,2446  |          |           |        |
| nd   | 587,56   | 1,61294 | delta Pe (F',r)                                      | 0,0003   |       | Pe (e,C')                           | 0,4785  |          |           |        |
| n632,8   | 632,80   | 1,60955 | <u>Chemical Properties</u>                           |          |       | Pe (C,r)                            | 0,2060  |          |           |        |
| nC'  | 643,85   | 1,60883 |  |          |       | Water Resistance                    | WRs     | A        | Pe (r,s)  | 0,3230 |
| n694,3   | 694,30   | -       | Acide Resistance                                     | AR*      | 1     | <u>Internal Transmittance</u>       |         |          |           |        |
| nr   | 706,52   | 1,60537 |  |          |       | 10 mm                               |         |          |           |        |
| ns   | 852,10   | 1,59994 |  |          |       | T 365                               |         |          | 0,852     |        |
| nt   | 1 013,90 | 1,59609 |  |          |       | T 400                               |         |          | 0,977     |        |
| n1060,0  | 1 060,00 | 1,59522 |  |          |       | T 440                               |         |          | 0,986     |        |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                         |          |       | T 550                               |         |          | 0,996     |        |
| Transformation Temperature, C                      | Tg       | 475     | Density, g/c.cm.                                     | SG       | 3,57  | T 640                               |         |          | 0,994     |        |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 74      | Grindability   | HG       | HG3   | Ta                                  |         |          | 0,996     |        |
|  |          |         | Knoop Hardness                                       | KH       | -     |                                     |         |          |           |        |
|  |          |         | Photoelastic Coefficient, nm/lcm 10 <sup>-5</sup> Pa | K        | 2,95  |                                     |         |          |           |        |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |  |          |       | <u>Other Properties</u>             |         |          |           |        |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs  | 23       |       | Bubble                              |         |          | B 3       |        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs  | 44       |       | Farbcode                            |         |          | FC 36\34  |        |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>57</b>  |          |       | <b>4 492 316 000</b>                |         |          |           |        |



| DATA SHEET   |          |         | F2  |          |       | 616 366                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,61655 | Abbe Number   | Vd       | 36,61 | Dispersion                          | nF-nC   | 0,016840 |
|  | ne       | 1,62054 |   | Ve       | 36,35 |                                     | nF'-nC' | 0,017072 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,66224 | nF-nC   | 0,016840 |       | Pe (i,h)                            | 0,9040  |          |
| nh   | 404,66   | 1,64680 | nF'-nC'   | 0,017072 |       | Pe (h,g)                            | 0,4998  |          |
| ng   | 435,83   | 1,63827 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,5168  |          |
| nF'  | 479,99   | 1,62944 | delta Pe (i,F')                                     | 0,0020   |       | Pe (F',e)                           | 0,5214  |          |
| n488,0   | 488,00   | 1,62814 | delta Pe (g,F')                                     | 0,0004   |       | Pe (e,d)                            | 0,2341  |          |
| ne   | 546,07   | 1,62054 | delta Pe (F',e)                                     | -0,0008  |       | Pe (d,C')                           | 0,2446  |          |
| nd   | 587,56   | 1,61655 | delta Pe (F',r)                                     | -0,0003  |       | Pe (e,C')                           | 0,4786  |          |
| n632,8   | 632,80   | 1,61310 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2050  |          |
| nC'  | 643,85   | 1,61237 | Water Resistance                                    | WRs      | A     | Pe (r,s)                            | 0,3220  |          |
| n694,3   | 694,30   | 1,60948 | Acide Resistance                                    | AR*      | 2     | Pe (s,t)                            | 0,2270  |          |
| nr   | 706,52   | 1,60887 |   |          |       | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,60337 |   |          |       | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,59949 |   |          |       | T 365                               | 0,796   |          |
| n1060,0  | 1 060,00 | 1,59861 |   |          |       | T 400                               | 0,965   |          |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |       | T 440                               | 0,981   |          |
| Transformation Temperature, C                      | Tg       | 460     | Density, g/c.cm.                                    | SG       | 3,60  | T 550                               | 0,994   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 75      | Grindability  | HG       | HG2   | T 640                               | 0,992   |          |
|  |          |         | Knoop Hardness                                      | KH       | -     | Ta                                  | 0,994   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 3,00  |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 23       |       | Bubble                              | B       | 3        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 44       |       | Farbcode                            | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>64</b>   |          |       | <b>4 492 318 000</b>                |         |          |

| DATA SHEET                                      |          |         | F4   |          |        | 624 359                             |         |          |
|---|----------|---------|--|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                                | nd       | 1,62435 | Abbe Number  | Vd       | 35,92  | Dispersion                          | nF-nC   | 0,017380 |
|   | ne       | 1,62847 |  | Ve       | 35,67  |                                     | nF'-nC' | 0,017621 |
| <u>Refractive Indices</u>                       |          |         | <u>Partial Dispersions</u>                               |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | 1,67162 | nF-nC  | 0,017380 |        | Pe (i,h)                            | 0,9100  |          |
| nh  | 404,66   | 1,65559 | nF'-nC'  | 0,017621 |        | Pe (h,g)                            | 0,5269  |          |
| ng  | 435,83   | 1,64678 | <u>Deviation of Relative Partial Dispersions</u>         |          |        | Pe (g,F')                           | 0,5446  |          |
| nF'   | 479,99   | 1,63767 | delta Pe (i,F')  | 0,0010   |        | Pe (F',e)                           | 0,5502  |          |
| n488,0  | 488,00   | 1,63632 | delta Pe (g,F')  | -0,0006  |        | Pe (e,d)                            | 0,2464  |          |
| ne  | 546,07   | 1,62847 | delta Pe (F',e)  | -0,0004  |        | Pe (d,C')                           | 0,2572  |          |
| nd  | 587,56   | 1,62435 | delta Pe (F',r)  | -0,0006  |        | Pe (e,C')                           | 0,5036  |          |
| n632,8  | 632,80   | 1,62081 | <u>Chemical Properties</u>                               |          |        | Pe (C,r)                            | 0,2150  |          |
| nC'   | 643,85   | 1,62005 | Water Resistance   | WRs      | A      | Pe (r,s)                            | 0,3370  |          |
| n694,3  | 694,30   | 1,61708 | Acide Resistance   | AR*      | 2      | Pe (s,t)                            | 0,2370  |          |
| nr  | 706,52   | 1,61645 | <u>Mechanical Properties</u>                             |          |        | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,61081 | Density, g/c.cm.   | SG       | 3,67   | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,60684 | Grindability   | HG       | HG3    | T 365                               | 0,676   |          |
| n1060,0   | 1 060,00 | 1,60594 | Knoop Hardness   | KH       | 347,00 | T 400                               | 0,962   |          |
| <u>Termal Properties</u>                        |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>^</sup> -5 Pa | K        | 3,00   | T 440                               | 0,980   |          |
| Transformation<br>Temperature, C                | Tg       | 460     | <u>Temperature Coefficient of Refractive Index</u>       |          |        | T 550                               | 0,995   |          |
| Exspansion<br>Coefficient, 10 <sup>^</sup> -7/C | Alpha    | 74      | Range of Temperature, C: - 60 ... 20, C'-Line            | NTabs    | 25     | T 640                               | 0,992   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line             | NTabs    | 48     | Ta                                  | 0,995   |          |
|   |          |         |  |          |        | <u>Other Properties</u>             |         |          |
|   |          |         |  |          |        | Bubble                              | B       | 3        |
|   |          |         |  |          |        | Farbcode                            | FC      | 39\35    |
| <b>PG&amp;F, TM (UA)</b>                        |          |         | <b>71</b>  |          |        | <b>4 492 320 000</b>                |         |          |

| DATA SHEET   |          |         | F6   |          |       | 603 379                             |         |          |
|--|----------|---------|--|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,60324 | Abbe Number                                      | Vd       | 37,94 | Dispersion                          | nF-nC   | 0,015900 |
|  | ne       | 1,60702 |  | Ve       | 37,68 |                                     | nF'-nC' | 0,016110 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                       |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,64601 | nF-nC  | 0,015900 |       | Pe (i,h)                            | 0,8920  |          |
| nh   | 404,66   | 1,63164 | nF'-nC'  | 0,016110 |       | Pe (h,g)                            | 0,4948  |          |
| ng   | 435,83   | 1,62367 | <u>Deviation of Relative Partial Dispersions</u> |          |       | Pe (g,F')                           | 0,5131  |          |
| nF'  | 479,99   | 1,61540 |  |          |       | delta Pe (i,F')                     | -0,0070 |          |
| n488,0   | 488,00   | 1,61417 | delta Pe (g,F')                                  | -0,0014  |       | Pe (e,d)                            | 0,2344  |          |
| ne   | 546,07   | 1,60702 | delta Pe (F',e)                                  | -0,0008  |       | Pe (d,C')                           | 0,2450  |          |
| nd   | 587,56   | 1,60324 | delta Pe (F',r)                                  | -0,0002  |       | Pe (e,C')                           | 0,4794  |          |
| n632,8   | 632,80   | 1,59998 | <u>Chemical Properties</u>                       |          |       | Pe (C,r)                            | 0,2060  |          |
| nC'  | 643,85   | 1,59929 |  |          |       | Water Resistance                    | WRs     | A        |
| n694,3   | 694,30   | 1,59655 | Acide Resistance                                 | AR*      | 1     | Pe (s,t)                            | 0,2320  |          |
| nr   | 706,52   | 1,59597 | <u>Mechanical Properties</u>                     |          |       | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,59074 |  |          |       | Density, g/c.cm.                    | SG      | 3,48     |
| nt   | 1 013,90 | 1,58701 | Grindability                                     | HG       | HG3   | T 365                               | -       |          |
| n1060,0  | 1 060,00 | 1,58616 | Knoop Hardness                                   | KH       | -     | T 400                               | 0,979   |          |
| <u>Thermal Properties</u>                          |          |         | Photoelastic Coefficient,                        | K        | 3,05  | T 440                               | 0,985   |          |
|  |          |         | Transformation Temperature, C                    | Tg       | 460   | T 550                               | 0,995   |          |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        |          |         | Alpha  | 73       |       | T 640                               | 0,993   |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | NTabs 24<br>NTabs 41                             |          |       | <u>Other Properties</u>             |         |          |
|  |          |         |  |          |       | Bubble B 4                          |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | Range of Temperature, C: 20 ... 120, C'-Line     |          |       | Farbcode FC 39\34                   |         |          |
| PG&F, TM (UA)                                      |          |         | 52   |          |       | 4 492 322 000                       |         |          |

| DATA SHEET   |          |         | F8  |          |           | 624 355                             |         |          |  |
|--|----------|---------|---|----------|-----------|-------------------------------------|---------|----------|--|
| Refractive Index                                   | nd       | 1,62495 | Abbe Number   | Vd       | 35,57     | Dispersion                          | nF-nC   | 0,017570 |  |
|  | ne       | 1,62911 |   | Ve       | 35,31     |                                     | nF'-nC' | 0,017816 |  |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Relative Partial Dispersions</u> |         |          |  |
| ni   | 365,00   | 1,67288 | nF-nC   | 0,017570 | Pe (i,h)  | 0,9130                              |         |          |  |
| nh   | 404,66   | 1,65661 | nF'-nC'   | 0,017816 | Pe (h,g)  | 0,5024                              |         |          |  |
| ng   | 435,83   | 1,64766 | <u>Deviation of Relative Partial Dispersions</u>    |          |           | Pe (g,F')                           | 0,5181  |          |  |
| nF'  | 479,99   | 1,63843 | delta Pe (i,F')                                     | 0,0050   | Pe (F',e) | 0,5230                              |         |          |  |
| n488,0   | 488,00   | 1,63707 | delta Pe (g,F')                                     | 0,0001   | Pe (e,d)  | 0,2335                              |         |          |  |
| ne   | 546,07   | 1,62911 | delta Pe (F',e)                                     | 0,0002   | Pe (d,C') | 0,2436                              |         |          |  |
| nd   | 587,56   | 1,62495 | delta Pe (F',r)                                     | -0,0008  | Pe (e,C') | 0,4771                              |         |          |  |
| n632,8   | 632,80   | 1,62137 | <u>Chemical Properties</u>                          |          |           | Pe (C,r)                            | 0,2050  |          |  |
| nC'  | 643,85   | 1,62061 | Water Resistance                                    | WRs      | C         | Pe (r,s)                            | 0,3190  |          |  |
| n694,3   | 694,30   | 1,61760 | Acide Resistance                                    | AR*      | 4         | Pe (s,t)                            | 0,2240  |          |  |
| nr   | 706,52   | 1,61697 |   |          |           | <u>Internal Transmittance</u>       |         |          |  |
| ns   | 852,10   | 1,61128 |   |          |           | 10 mm                               |         |          |  |
| nt   | 1 013,90 | 1,60728 |   |          |           | T 365                               | 0,871   |          |  |
| n1060,0  | 1 060,00 | 1,60638 |   |          |           | T 400                               | 0,980   |          |  |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                               | 0,988   |          |  |
| Transformation Temperature, C                      | Tg       | 420     | Density, g/c.cm.                                    | SG       | 3,61      | T 550                               | 0,994   |          |  |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 99      | Grindability  | HG       | HG3       | T 640                               | 0,991   |          |  |
|  |          |         | Knoop Hardness                                      | KH       | -         | Ta                                  | 0,994   |          |  |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,75      |                                     |         |          |  |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |           | <u>Other Properties</u>             |         |          |  |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | -9       |           | Bubble                              | B       | 4        |  |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 5        |           | Farbcode                            | FC      | 36\34    |  |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>70</b>   |          |           | <b>4 492 325 000</b>                |         |          |  |

| DATA SHEET   |          |         | F9  |          |                         | 613 345                              |         |          |
|--|----------|---------|---|----------|-------------------------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,61386 | Abbe Number                                       | Vd       | 34,58                   | Dispersion                           | nF-nC   | 0,017750 |
|  | ne       | 1,61804 |   | Ve       | 34,31                   |                                      | nF'-nC' | 0,018014 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                        |          |                         | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,66388 | nF-nC   | 0,017750 |                         | Pe (i,h)                             | 0,9740  |          |
| nh   | 404,66   | 1,64633 | nF'-nC'   | 0,018014 |                         | Pe (h,g)                             | 0,5185  |          |
| ng   | 435,83   | 1,63699 | <u>Deviation of Realative Partial Dispersions</u> |          |                         | Pe (g,F')                            | 0,5271  |          |
| nF'  | 479,99   | 1,62750 |   |          |                         | delta Pe (i,F')                      | 0,0820  |          |
| n488,0   | 488,00   | 1,62610 | delta Pe (g,F')                                   | 0,0077   |                         | Pe (e,d)                             | 0,2325  |          |
| ne   | 546,07   | 1,61804 | delta Pe (F',e)                                   | 0,0014   |                         | Pe (d,C')                            | 0,2427  |          |
| nd   | 587,56   | 1,61386 | delta Pe (F',r)                                   | -0,0007  |                         | Pe (e,C')                            | 0,4752  |          |
| n632,8   | 632,80   | 1,61024 | <u>Chemical Properties</u>                        |          |                         | Pe (C,r)                             | 0,2030  |          |
| nC'  | 643,85   | 1,60948 |   |          |                         | Water Resistance                     | WRs     | A        |
| n694,3   | 694,30   | 1,60646 | Acide Resistance                                  | AR*      | 1                       | Pe (s,t)                             | 0,2250  |          |
| nr   | 706,52   | 1,60582 | <u>Mechanical Properties</u>                      |          |                         | <u>Internal Transmittance</u>        |         |          |
| ns   | 852,10   | 1,60010 |   |          |                         | Density, g\c.cm.                     | SG      | 2,93     |
| nt   | 1 013,90 | 1,59605 | Grindability                                      | HG       | HG2                     | T 365                                | 0,495   |          |
| n1060,0  | 1 060,00 | 1,59513 | Knoop Hardness                                    | KH       | -                       | T 400                                | 0,919   |          |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient,                         | K        | 3,15                    | T 440                                | 0,965   |          |
| Transformation Temperature, C                      | Tg       | 445     | nm\cm 10 <sup>-5</sup> Pa                         |          |                         | T 550                                | 0,992   |          |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 96      |   |          |                         | T 640                                | 0,988   |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |                         | Ta                                   | 0,992   |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    |         | -25   |          | <u>Other Properties</u> |                                      |         |          |
| Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    |         | -11   |          | Bubble                  | B                                    | 4       |          |
|  |          |         |   |          | Farbcode                | FC                                   | 39\36   |          |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>60</b>   |          |                         | <b>4 492 327 000</b>                 |         |          |

| DATA SHEET   |          |         | F13   |          |       | 620 363                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,62005 | Abbe Number   | Vd       | 36,35 | Dispersion                          | nF-nC   | 0,017060 |
|  | ne       | 1,62408 |   | Ve       | 36,09 |                                     | nF'-nC' | 0,017294 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,66634 | nF-nC   | 0,017060 |       | Pe (i,h)                            | 0,9050  |          |
| nh   | 404,66   | 1,65069 | nF'-nC'   | 0,017294 |       | Pe (h,g)                            | 0,4993  |          |
| ng   | 435,83   | 1,64205 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,5168  |          |
| nF'  | 479,99   | 1,63312 | delta Pe (i,F')                                     | 0,0000   |       | Pe (F',e)                           | 0,5223  |          |
| n488,0   | 488,00   | 1,63179 | delta Pe (g,F')                                     | 0,0000   |       | Pe (e,d)                            | 0,2333  |          |
| ne   | 546,07   | 1,62408 | delta Pe (F',e)                                     | 0,0000   |       | Pe (d,C')                           | 0,2443  |          |
| nd   | 587,56   | 1,62005 | delta Pe (F',r)                                     | 0,0000   |       | Pe (e,C')                           | 0,4777  |          |
| n632,8   | 632,80   | 1,61656 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2050  |          |
| nC'  | 643,85   | 1,61582 | Water Resistance                                    | WRs      | A     | Pe (r,s)                            | 0,3210  |          |
| n694,3   | 694,30   | 1,61289 | Acide Resistance                                    | AR*      | 3     | Pe (s,t)                            | 0,2270  |          |
| nr   | 706,52   | 1,61227 | <u>Internal Transmittance</u>                       |          |       | 10 mm                               |         |          |
| ns   | 852,10   | 1,60671 | T 365   |          |       | 0,772                               |         |          |
| nt   | 1 013,90 | 1,60278 | T 400   |          |       | 0,964                               |         |          |
| n1060,0  | 1 060,00 | 1,60189 | T 440   |          |       | 0,983                               |         |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |       | T 550                               |         |          |
| Transformation Temperature, C                      | Tg       | 460     | Density, g\c.cm.                                    | SG       | 3,63  | T 640                               |         |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 74      | Grindability  | HG       | HG3   | 0,995                               |         |          |
|  |          |         | Knoop Hardness                                      | KH       | -     | Ta                                  |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,85  | 0,996                               |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |       | Bubble                              |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 30       |       | Farbcode                            |         |          |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 48       |       | FC                                  |         |          |
|  |          |         |   |          |       | 37\35                               |         |          |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>66</b>   |          |       | <b>4 492 329 000</b>                |         |          |

| DATA SHEET                                     |          |         | F18  |          |       | 624 352                              |         |          |
|--|----------|---------|--|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                               | nd       | 1,62496 | Abbe Number  | Vd       | 35,29 | Dispersion                           | nF-nC   | 0,017710 |
|  | ne       | 1,62915 |  | Ve       | 35,02 |                                      | nF'-nC' | 0,017963 |
| <u>Refractive Indices</u>                      |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,67345 | nF-nC  | 0,017710 |       | Pe (i,h)                             | 0,9200  |          |
| nh   | 404,66   | 1,65693 | nF'-nC'  | 0,017963 |       | Pe (h,g)                             | 0,5042  |          |
| ng   | 435,83   | 1,64787 | <u>Deviation of Realative Partial Dispersions</u>      |          |       | Pe (g,F')                            | 0,5191  |          |
| nF'  | 479,99   | 1,63855 | delta Pe (i,F')  | 0,0120   |       | Pe (F',e)                            | 0,5232  |          |
| n488,0   | 488,00   | 1,63717 | delta Pe (g,F')  | 0,0007   |       | Pe (e,d)                             | 0,2336  |          |
| ne   | 546,07   | 1,62915 | delta Pe (F',e)  | 0,0003   |       | Pe (d,C')                            | 0,2432  |          |
| nd   | 587,56   | 1,62496 | delta Pe (F',r)  | -0,0004  |       | Pe (e,C')                            | 0,4768  |          |
| n632,8   | 632,80   | 1,62135 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                             | 0,2040  |          |
| nC'  | 643,85   | 1,62059 | Water Resistance                                       | WRs      | C     | Pe (r,s)                             | 0,3170  |          |
| n694,3   | 694,30   | 1,61756 | Acide Resistance                                       | AR*      | 5     | Pe (s,t)                             | 0,2200  |          |
| nr   | 706,52   | 1,61692 | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>        |         |          |
| ns   | 852,10   | 1,61123 | Density, glc.cm.                                       | SG       | 3,59  | 10 mm                                |         |          |
| nt   | 1 013,90 | 1,60727 | Grindability   | HG       | HG2   | T 365                                | 0,871   |          |
| n1060,0  | 1 060,00 | 1,60638 | Knoop Hardness   | KH       | -     | T 400                                | 0,980   |          |
| <u>Termal Properties</u>                       |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 2,75  | T 440                                | 0,988   |          |
| Transformation<br>Temperature, C               | Tg       | 425     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550                                | 0,991   |          |
| Exspansion Coefficient,<br>10 <sup>-7</sup> /C | Alpha    | 114     | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | -34   | T 640                                | 0,993   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | -20   | Ta                                   | 0,991   |          |
|  |          |         |  |          |       | <u>Other Properties</u>              |         |          |
|  |          |         |  |          |       | Bubble                               | B       | 4        |
|  |          |         |  |          |       | Farbcode                             | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                       |          |         | <b>69</b>  |          |       | <b>4 492 331 000</b>                 |         |          |

| DATA SHEET                                 |          |         | F20   |          |           | 636 351                             |         |          |  |
|--|----------|---------|---|----------|-----------|-------------------------------------|---------|----------|--|
| Refractive Index                           | nd       | 1,63606 | Abbe Number   | Vd       | 35,16     | Dispersion                          | nF-nC   | 0,018090 |  |
|  | ne       | 1,64034 |   | Ve       | 34,90     |                                     | nF'-nC' | 0,018348 |  |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Relative Partial Dispersions</u> |         |          |  |
| ni   | 365,00   | 1,68614 | nF-nC   | 0,018090 | Pe (i,h)  | 0,9430                              |         |          |  |
| nh   | 404,66   | 1,66884 | nF'-nC'   | 0,018348 | Pe (h,g)  | 0,5088                              |         |          |  |
| ng   | 435,83   | 1,65950 | <u>Deviation of Relative Partial Dispersions</u>    |          |           | Pe (g,F')                           | 0,5213  |          |  |
| nF'  | 479,99   | 1,64994 | delta Pe (i,F')                                     | 0,0410   | Pe (F',e) | 0,5232                              |         |          |  |
| n488,0                                     | 488,00   | 1,64853 | delta Pe (g,F')                                     | 0,0027   | Pe (e,d)  | 0,2335                              |         |          |  |
| ne   | 546,07   | 1,64034 | delta Pe (F',e)                                     | 0,0002   | Pe (d,C') | 0,2433                              |         |          |  |
| nd   | 587,56   | 1,63606 | delta Pe (F',r)                                     | -0,0005  | Pe (e,C') | 0,4768                              |         |          |  |
| n632,8                                     | 632,80   | 1,63237 | <u>Chemical Properties</u>                          |          |           | Pe (C,r)                            | 0,2050  |          |  |
| nC'  | 643,85   | 1,63159 | Water Resistance                                    | WRs      | A         | Pe (r,s)                            | 0,3220  |          |  |
| n694,3                                     | 694,30   | 1,62849 | Acide Resistance                                    | AR*      | 1         | Pe (s,t)                            | 0,2290  |          |  |
| nr   | 706,52   | 1,62784 | <u>Mechanical Properties</u>                        |          |           | <u>Internal Transmittance</u>       |         |          |  |
| ns   | 852,10   | 1,62193 | Density, g\c.cm.                                    | SG       | 2,74      | 10 mm                               |         |          |  |
| nt   | 1 013,90 | 1,61772 | Grindability  | HG       | HG3       | T 365                               | 0,398   |          |  |
| n1060,0                                    | 1 060,00 | 1,61677 | Knoop Hardness                                      | KH       | -         | T 400                               | 0,995   |          |  |
| <u>Thermal Properties</u>                  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,65      | T 440                               | 0,996   |          |  |
| Transformation Temperature, C              | Tg       | 560     | <u>Temperature Coefficient of Refractive Index</u>  |          |           | T 550                               | 0,997   |          |  |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | -       | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | -         | T 640                               | 0,998   |          |  |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | -         | Ta                                  | 0,997   |          |  |
|  |          |         |   |          |           | <u>Other Properties</u>             |         |          |  |
|  |          |         |   |          |           | Bubble                              | B       | 4        |  |
|  |          |         |   |          |           | Farbcode                            | FC      | 39\37    |  |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>75</b>   |          |           | <b>4 492 332 000</b>                |         |          |  |



| DATA SHEET   |          |         | TF1   |          |        | 647 338                                       |         |          |
|--|----------|---------|---|----------|--------|---|---------|----------|
| Refractive Index                                   | nd       | 1,64766 | Abbe Number   | Vd       | 33,87  | Dispersion                                    | nF-nC   | 0,019120 |
|  | ne       | 1,65219 |   | Ve       | 33,62  |   | nF'-nC' | 0,019397 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u>           |         |          |
| ni   | 365,00   | 1,70022 | nF-nC   | 0,019120 |        | Pe (i,h)                                      | 0,9240  |          |
| nh   | 404,66   | 1,68229 | nF'-nC'   | 0,019397 |        | Pe (h,g)                                      | 0,5072  |          |
| ng   | 435,83   | 1,67245 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                                     | 0,5209  |          |
| nF'  | 479,99   | 1,66235 |   |          |        | delta Pe (i,F')                               | 0,0080  |          |
| n488,0   | 488,00   | 1,66085 | delta Pe (g,F')                                     | 0,0004   |        | Pe (e,d)                                      | 0,2332  |          |
| ne   | 546,07   | 1,65219 | delta Pe (F',e)                                     | 0,0000   |        | Pe (d,C')                                     | 0,2431  |          |
| nd   | 587,56   | 1,64766 | delta Pe (F',r)                                     | -0,0004  |        | Pe (e,C')                                     | 0,4763  |          |
| n632,8   | 632,80   | 1,64378 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                                      | 0,2030  |          |
| nC'  | 643,85   | 1,64295 |   |          |        | Water Resistance                              | WRs     | A        |
| n694,3   | 694,30   | 1,63970 | Acide Resistance                                    | AR*      | 4      | <u>Internal Transmittance</u>                 |         |          |
| nr   | 706,52   | 1,63901 | <u>Mechanical Properties</u>                        |          |        | 10 mm   |         |          |
| ns   | 852,10   | 1,63289 |   |          |        | Density, g\c.cm.                              | SG      | 3,86     |
| nt   | 1 013,90 | 1,62862 | Grindability  | HG       | HG3    | T 400   | 0,960   |          |
| n1060,0  | 1 060,00 | 1,62767 | Knoop Hardness                                      | KH       | 331,00 | T 440   | 0,983   |          |
| <u>Thermal Properties</u>                          |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,60   | T 550   | 0,996   |          |
| Transformation Temperature, C                      | Tg       | 455     | <u>Temperature Coefficient of Refractive Index</u>  |          |        | T 640   | 0,994   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 85      |   |          |        | Range of Temperature, C: - 60 ... 20, C'-Line | NTabs   | 10       |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 33     | <u>Other Properties</u>                       |         |          |
|  |          |         |   |          |        | Bubble  | B       | 3        |
|  |          |         |   |          |        | Farbcode                                      | FC      | 37\35    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>77</b>   |          |        | <b>4 492 341 000</b>                          |         |          |

| DATA SHEET   |          |         | TF2   |          |           | 672 322                             |         |          |  |
|--|----------|---------|---|----------|-----------|-------------------------------------|---------|----------|--|
| Refractive Index                                   | nd       | 1,67268 | Abbe Number   | Vd       | 32,23     | Dispersion                          | nF-nC   | 0,020870 |  |
|  | ne       | 1,67762 |   | Ve       | 31,99     |                                     | nF'-nC' | 0,021180 |  |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Relative Partial Dispersions</u> |         |          |  |
| ni   | 365,00   | 1,73062 | nF-nC   | 0,020870 | Pe (i,h)  | 0,9410                              |         |          |  |
| nh   | 404,66   | 1,71068 | nF'-nC'   | 0,021180 | Pe (h,g)  | 0,5122                              |         |          |  |
| ng   | 435,83   | 1,69983 | <u>Deviation of Relative Partial Dispersions</u>    |          |           | Pe (g,F')                           | 0,5240  |          |  |
| nF'  | 479,99   | 1,68873 | delta Pe (i,F')                                     | 0,0180   | Pe (F',e) | 0,5248                              |         |          |  |
| n488,0   | 488,00   | 1,68710 | delta Pe (g,F')                                     | 0,0011   | Pe (e,d)  | 0,2331                              |         |          |  |
| ne   | 546,07   | 1,67762 | delta Pe (F',e)                                     | 0,0002   | Pe (d,C') | 0,2421                              |         |          |  |
| nd   | 587,56   | 1,67268 | delta Pe (F',r)                                     | -0,0001  | Pe (e,C') | 0,4751                              |         |          |  |
| n632,8   | 632,80   | 1,66844 | <u>Chemical Properties</u>                          |          |           | Pe (C,r)                            | 0,2020  |          |  |
| nC'  | 643,85   | 1,66755 | Water Resistance                                    | WRs      | A         | Pe (r,s)                            | 0,3130  |          |  |
| n694,3   | 694,30   | 1,66401 | Acide Resistance                                    | AR*      | 5         | Pe (s,t)                            | 0,2160  |          |  |
| nr   | 706,52   | 1,66327 |   |          |           | <u>Internal Transmittance</u>       |         |          |  |
| ns   | 852,10   | 1,65665 |   |          |           | 10 mm                               |         |          |  |
| nt   | 1 013,90 | 1,65208 |   |          |           | T 365                               | 0,495   |          |  |
| n1060,0  | 1 060,00 | 1,65106 |   |          |           | T 400                               | 0,903   |          |  |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                               | 0,973   |          |  |
| Transformation Temperature, C                      | Tg       | 445     | Density, g/c.cm.                                    | SG       | 4,09      | T 550                               | 0,995   |          |  |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 76      | Grindability  | HG       | HG3       | T 640                               | 0,993   |          |  |
|  |          |         | Knoop Hardness                                      | KH       | 325,00    | Ta                                  | 0,995   |          |  |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,25      |                                     |         |          |  |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |           | <u>Other Properties</u>             |         |          |  |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 32       | Bubble    |                                     | B       | 4        |  |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 55       | Farbcode  |                                     | FC      | 39\36    |  |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>87</b>   |          |           | <b>4 492 343 000</b>                |         |          |  |

| DATA SHEET   |          |         | TF3   |          |          | 717 295                             |         |          |   |
|--|----------|---------|---|----------|----------|-------------------------------------|---------|----------|---|
| Refractive Index                                   | nd       | 1,71741 | Abbe Number   | Vd       | 29,51    | Dispersion                          | nF-nC   | 0,024310 |   |
|  | ne       | 1,72317 |   | Ve       | 29,29    |                                     | nF'-nC' | 0,024691 |   |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |          | <u>Relative Partial Dispersions</u> |         |          |   |
| ni   | 365,00   | 1,78612 | nF-nC   | 0,024310 |          | Pe (i,h)                            | 0,9710  |          |   |
| nh   | 404,66   | 1,76214 | nF'-nC'   | 0,024691 |          | Pe (h,g)                            | 0,5217  |          |   |
| ng   | 435,83   | 1,74926 | <u>Deviation of Relative Partial Dispersions</u>    |          |          | Pe (g,F')                           | 0,5304  |          |   |
| nF'  | 479,99   | 1,73616 | delta Pe (i,F')                                     | 0,0380   |          | Pe (F',e)                           | 0,5263  |          |   |
| n488,0   | 488,00   | 1,73425 | delta Pe (g,F')                                     | 0,0035   |          | Pe (e,d)                            | 0,2330  |          |   |
| ne   | 546,07   | 1,72317 | delta Pe (F',e)                                     | 0,0001   |          | Pe (d,C')                           | 0,2407  |          |   |
| nd   | 587,56   | 1,71741 | delta Pe (F',r)                                     | 0,0001   |          | Pe (e,C')                           | 0,4737  |          |   |
| n632,8   | 632,80   | 1,71250 | <u>Chemical Properties</u>                          |          |          | Pe (C,r)                            | 0,2000  |          |   |
| nC'  | 643,85   | 1,71147 | Water Resistance                                    | WRs      | A        | Pe (r,s)                            | 0,3070  |          |   |
| n694,3   | 694,30   | 1,70738 | Acide Resistance                                    | AR*      | 4        | Pe (s,t)                            | 0,2090  |          |   |
| nr   | 706,52   | 1,70652 | <u>Internal Transmittance</u>                       |          |          | 10 mm                               |         |          |   |
| ns   | 852,10   | 1,69893 | T 365   |          |          | 0,326                               |         |          |   |
| nt   | 1 013,90 | 1,69376 | T 400   |          |          | 0,864                               |         |          |   |
| n1060,0  | 1 060,00 | 1,69263 | T 440   |          |          | 0,969                               |         |          |   |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |          | T 550                               |         |          |   |
| Transformation Temperature, C                      | Tg       | 430     | Density, g\c.cm.                                    | SG       | 4,46     | T 640                               |         |          |   |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 83      | Grindability  | HG       | HG3      | 0,993                               |         |          |   |
|  |          |         | Knoop Hardness                                      | KH       | -        | Ta                                  |         |          |   |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,85     | 0,996                               |         |          |   |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |          | Bubble                              |         |          |   |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          | NTabs   | 36  |          | Farbcode |                                     |         | B        | 4 |
| Range of Temperature, C: 20 ... 120, C'-Line       |          | NTabs   | 57  |          | FC       |                                     |         | 39\37    |   |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>94</b>   |          |          | <b>4 492 345 000</b>                |         |          |   |

| DATA SHEET                                 |          |         | TF4   |          |        | 740 275                             |         |          |
|--|----------|---------|---|----------|--------|-------------------------------------|---------|----------|
| Refractive Index                           | nd       | 1,75523 | Abbe Number   | Vd       | 27,53  | Dispersion                          | nF-nC   | 0,027430 |
|  | ne       | 1,76171 |   | Ve       | 27,32  |                                     | nF'-nC' | 0,027879 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,83360 | nF-nC   | 0,027430 |        | Pe (i,h)                            | 0,9870  |          |
| nh   | 404,66   | 1,80608 | nF'-nC'   | 0,027879 |        | Pe (h,g)                            | 0,5285  |          |
| ng   | 435,83   | 1,79135 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                           | 0,5348  |          |
| nF'  | 479,99   | 1,77644 | delta Pe (i,F')                                     | 0,0470   |        | Pe (F',e)                           | 0,5282  |          |
| n488,0                                     | 488,00   | 1,77426 | delta Pe (g,F')                                     | 0,0050   |        | Pe (e,d)                            | 0,2323  |          |
| ne   | 546,07   | 1,76171 | delta Pe (F',e)                                     | 0,0008   |        | Pe (d,C')                           | 0,2395  |          |
| nd   | 587,56   | 1,75523 | delta Pe (F',r)                                     | 0,0000   |        | Pe (e,C')                           | 0,4719  |          |
| n632,8                                     | 632,80   | 1,74971 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                            | 0,1990  |          |
| nC'  | 643,85   | 1,74856 | Water Resistance                                    | WRs      | A      | Pe (r,s)                            | 0,3030  |          |
| n694,3                                     | 694,30   | 1,74397 | Acide Resistance                                    | AR*      | 4      | Pe (s,t)                            | 0,2040  |          |
| nr   | 706,52   | 1,74301 | <u>Mechanical Properties</u>                        |          |        | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,73457 | Density, g/c.cm.                                    | SG       | 4,77   | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,72888 | Grindability  | HG       | HG3    | T 365                               | 0,156   |          |
| n1060,0                                    | 1 060,00 | 1,72765 | Knoop Hardness                                      | KH       | 293,00 | T 400                               | 0,806   |          |
| <u>Termal Properties</u>                   |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,25   | T 440                               | 0,954   |          |
| Transformation Temperature, C              | Tg       | 435     | <u>Temperature Coefficient of Refractive Index</u>  |          |        | T 550                               | 0,996   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 83      | Range of Temperature, C: - 60 ... 20, C'-Line       | NTabs    | 48     | T 640                               | 0,993   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 72     | Ta                                  | 0,996   |          |
|  |          |         |   |          |        | <u>Other Properties</u>             |         |          |
|  |          |         |   |          |        | Bubble                              | B       | 4        |
|  |          |         |   |          |        | Farbcode                            | FC      | 40\38    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>98</b>   |          |        | <b>4 492 349 000</b>                |         |          |

| DATA SHEET                                    |          |         | TF5  |          |           | 755 281                             |         |          |  |
|---|----------|---------|--|----------|-----------|-------------------------------------|---------|----------|--|
| Refractive Index                              | nd       | 1,74002 | Abbe Number  | Vd       | 28,16     | Dispersion                          | nF-nC   | 0,026280 |  |
|   | ne       | 1,74623 |  | Ve       | 27,94     |                                     | nF'-nC' | 0,026705 |  |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |           | <u>Relative Partial Dispersions</u> |         |          |  |
| ni  | 365,00   | 1,81477 | nF-nC  | 0,026280 | Pe (i,h)  | 0,9800                              |         |          |  |
| nh  | 404,66   | 1,78860 | nF'-nC'  | 0,026705 | Pe (h,g)  | 0,5262                              |         |          |  |
| ng  | 435,83   | 1,77455 | <u>Deviation of Relative Partial Dispersions</u>       |          |           | Pe (g,F')                           | 0,5327  |          |  |
| nF'   | 479,99   | 1,76032 | delta Pe (i,F')  | 0,0420   | Pe (F',e) | 0,5276                              |         |          |  |
| n488,0  | 488,00   | 1,75823 | delta Pe (g,F')  | 0,0038   | Pe (e,d)  | 0,2324                              |         |          |  |
| ne  | 546,07   | 1,74623 | delta Pe (F',e)  | 0,0006   | Pe (d,C') | 0,2399                              |         |          |  |
| nd  | 587,56   | 1,74002 | delta Pe (F',r)  | -0,0007  | Pe (e,C') | 0,4724                              |         |          |  |
| n632,8  | 632,80   | 1,73473 | <u>Chemical Properties</u>                             |          |           | Pe (C,r)                            | 0,1990  |          |  |
| nC'   | 643,85   | 1,73362 | Water Resistance                                       | WRs      | A         | Pe (r,s)                            | 0,3040  |          |  |
| n694,3  | 694,30   | 1,72923 | Acide Resistance                                       | AR*      | 4         | Pe (s,t)                            | 0,2060  |          |  |
| nr  | 706,52   | 1,72831 | <u>Mechanical Properties</u>                           |          |           | <u>Internal Transmittance</u>       |         |          |  |
| ns  | 852,10   | 1,72019 | Density, g/c.cm.                                       | SG       | 4,65      | 10 mm                               |         |          |  |
| nt  | 1 013,90 | 1,71470 | Grindability   | HG       | HG3       | T 365                               | 0,203   |          |  |
| n1060,0                                       | 1 060,00 | 1,71350 | Knoop Hardness   | KH       | 322,00    | T 400                               | 0,822   |          |  |
| <u>Thermal Properties</u>                     |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 1,50      | T 440                               | 0,962   |          |  |
| Transformation<br>Temperature, C              | Tg       | 440     | <u>Temperature Coefficient of Refractive Index</u>     |          |           | T 550                               | 0,996   |          |  |
| Expansion Coefficient,<br>10 <sup>-7</sup> /C | Alpha    | 82      | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | 44        | T 640                               | 0,993   |          |  |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 67        | Ta                                  | 0,996   |          |  |
|   |          |         |  |          |           | <u>Other Properties</u>             |         |          |  |
|   |          |         |  |          |           | Bubble                              | B       | 4        |  |
|   |          |         |  |          |           | Farbcode                            | FC      | 40\38    |  |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>101</b>   |          |           | <b>4 492 347 000</b>                |         |          |  |

| DATA SHEET   |          |         | TF7   |          |        | 728 283                              |         |          |
|--|----------|---------|---|----------|--------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,72822 | Abbe Number   | Vd       | 28,34  | Dispersion                           | nF-nC   | 0,025700 |
|  | ne       | 1,73429 |   | Ve       | 28,12  |                                      | nF'-nC' | 0,026111 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,80126 | nF-nC   | 0,025700 |        | Pe (i,h)                             | 0,9800  |          |
| nh   | 404,66   | 1,77566 | nF'-nC'   | 0,026111 |        | Pe (h,g)                             | 0,5249  |          |
| ng   | 435,83   | 1,76195 | <u>Deviation of Realative Partial Dispersions</u>   |          |        | Pe (g,F')                            | 0,5321  |          |
| nF'  | 479,99   | 1,74806 | delta Pe (i,F')                                     | 0,0420   |        | Pe (F',e)                            | 0,5272  |          |
| n488,0   | 488,00   | 1,74603 | delta Pe (g,F')                                     | 0,0035   |        | Pe (e,d)                             | 0,2325  |          |
| ne   | 546,07   | 1,73429 | delta Pe (F',e)                                     | 0,0003   |        | Pe (d,C')                            | 0,2403  |          |
| nd   | 587,56   | 1,72822 | delta Pe (F',r)                                     | 0,0000   |        | Pe (e,C')                            | 0,4728  |          |
| n632,8   | 632,80   | 1,72304 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                             | 0,1990  |          |
| nC'  | 643,85   | 1,72195 | Water Resistance                                    | WRs      | A      | Pe (r,s)                             | 0,3050  |          |
| n694,3   | 694,30   | 1,71764 | Acide Resistance                                    | AR*      | 4      | Pe (s,t)                             | 0,2060  |          |
| nr   | 706,52   | 1,71674 | <u>Internal Transmittance</u>                       |          |        | 10 mm                                |         |          |
| ns   | 852,10   | 1,70878 |   |          |        | T 365                                | 0,372   |          |
| nt   | 1 013,90 | 1,70339 |   |          |        | T 400                                | 0,887   |          |
| n1060,0  | 1 060,00 | 1,70222 |   |          |        | T 440                                | 0,972   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |        | T 550                                | 0,995   |          |
| Transformation Temperature, C                      | Tg       | 395     | Density, g/c.cm.                                    | SG       | 4,52   | T 640                                | 0,992   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 94      | Grindability  | HG       | HG2    | Ta                                   | 0,995   |          |
|  |          |         | Knoop Hardness                                      | KH       | 298,00 |                                      |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,65   |                                      |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |        | <u>Other Properties</u>              |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 19       |        | Bubble                               | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 39       |        | Farbcode                             | FC      | 39\37    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>96</b>   |          |        | <b>4 492 351 000</b>                 |         |          |

| DATA SHEET   |          |         | TF8   |          |        | 689 311                              |         |          |           |        |
|--|----------|---------|---|----------|--------|--------------------------------------|---------|----------|-----------|--------|
| Refractive Index                                   | nd       | 1,68949 | Abbe Number   | Vd       | 31,13  | Dispersion                           | nF-nC   | 0,022150 |           |        |
|  | ne       | 1,69473 |   | Ve       | 30,90  |                                      | nF'-nC' | 0,022486 |           |        |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Realative Partial Dispersions</u> |         |          |           |        |
| ni   | 365,00   | 1,75119 | nF-nC   | 0,022150 |        | Pe (i,h)                             | 0,9460  |          |           |        |
| nh   | 404,66   | 1,72992 | nF'-nC'   | 0,022486 |        | Pe (h,g)                             | 0,5139  |          |           |        |
| ng   | 435,83   | 1,71836 | <u>Deviation of Realative Partial Dispersions</u>   |          |        | Pe (g,F')                            | 0,5258  |          |           |        |
| nF'  | 479,99   | 1,70654 |   |          |        | delta Pe (i,F')                      | 0,0160  |          | Pe (F',e) | 0,5253 |
| n488,0   | 488,00   | 1,70480 | delta Pe (g,F')                                     | 0,0012   |        | Pe (e,d)                             | 0,2329  |          |           |        |
| ne   | 546,07   | 1,69473 | delta Pe (F',e)                                     | 0,0000   |        | Pe (d,C')                            | 0,2418  |          |           |        |
| nd   | 587,56   | 1,68949 | delta Pe (F',r)                                     | 0,0002   |        | Pe (e,C')                            | 0,4747  |          |           |        |
| n632,8   | 632,80   | 1,68500 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                             | 0,2020  |          |           |        |
| nC'  | 643,85   | 1,68406 |   |          |        | Water Resistance                     | WRs     | A        | Pe (r,s)  | 0,3110 |
| n694,3   | 694,30   | 1,68031 | Acide Resistance                                    | AR*      | 4      | Pe (s,t)                             | 0,2140  |          |           |        |
| nr   | 706,52   | 1,67952 | <u>Mechanical Properties</u>                        |          |        | <u>Internal Transmittance</u>        |         |          |           |        |
| ns   | 852,10   | 1,67252 |   |          |        | Density, g/c.cm.                     | SG      | 4,23     | 10 mm     |        |
| nt   | 1 013,90 | 1,66770 | Grindability  | HG       | HG3    | T 365                                | 0,671   |          |           |        |
| n1060,0  | 1 060,00 | 1,66663 | Knoop Hardness                                      | KH       | 322,00 | T 400                                | 0,917   |          |           |        |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient, nm/cm 10 <sup>-5</sup> Pa | K        | 2,10   | T 440                                | 0,974   |          |           |        |
|  |          |         | Transformation Temperature, C                       | Tg       | 420    | T 550                                |         |          | 0,996     |        |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |        | T 640                                |         |          | 0,992     |        |
|  |          |         |   |          |        | Ta                                   |         |          | 0,996     |        |
| Expansion Coefficient, 10 <sup>-7</sup> /C         |          |         | Alpha   |          |        | 81                                   |         |          |           |        |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   |          |        | 33                                   |         |          |           |        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   |          |        | 52                                   |         |          |           |        |
| Bubble   |          |         | B   |          |        | 4                                    |         |          |           |        |
| Farbcode   |          |         | FC  |          |        | 38\35                                |         |          |           |        |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>89</b>   |          |        | <b>4 492 353 000</b>                 |         |          |           |        |

| DATA SHEET                                    |          |         | TF10   |          |        | 806 253                                       |         |          |
|---|----------|---------|--|----------|--------|---|---------|----------|
| Refractive Index                              | nd       | 1,80627 | Abbe Number  | Vd       | 25,37  | Dispersion                                    | nF-nC   | 0,031780 |
|   | ne       | 1,81377 |  | Ve       | 25,17  |   | nF'-nC' | 0,032326 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |        | <u>Relative Partial Dispersions</u>           |         |          |
| ni  | 365,00   | 1,89876 | nF-nC  | 0,031780 |        | Pe (i,h)                                      | 1,0220  |          |
| nh  | 404,66   | 1,86571 | nF'-nC'  | 0,032326 |        | Pe (h,g)                                      | 0,5374  |          |
| ng  | 435,83   | 1,84834 | <u>Deviation of Relative Partial Dispersions</u>       |          |        | Pe (g,F')                                     | 0,5395  |          |
| nF'   | 479,99   | 1,83090 |  |          |        | delta Pe (i,F')                               | 0,0760  |          |
| n488,0  | 488,00   | 1,82836 | delta Pe (g,F')  | 0,0065   |        | Pe (e,d)                                      | 0,2318  |          |
| ne  | 546,07   | 1,81377 | delta Pe (F',e)  | 0,0014   |        | Pe (d,C')                                     | 0,2383  |          |
| nd  | 587,56   | 1,80627 | delta Pe (F',r)  | -0,0009  |        | Pe (e,C')                                     | 0,4701  |          |
| n632,8  | 632,80   | 1,79991 | <u>Chemical Properties</u>                             |          |        | Pe (C,r)                                      | 0,1970  |          |
| nC'   | 643,85   | 1,79857 |  |          |        | Water Resistance                              | WRs     | A        |
| n694,3  | 694,30   | 1,79332 | Acide Resistance                                       | AR*      | 4      | <u>Internal Transmittance</u>                 |         |          |
| nr  | 706,52   | 1,79222 | <u>Mechanical Properties</u>                           |          |        | 10 mm   |         |          |
| ns  | 852,10   | 1,78263 |  |          |        | Density, g/c.cm.                              | SG      | 5,19     |
| nt  | 1 013,90 | 1,77626 | Grindability   | HG       | HG2    | T 400   | 0,610   |          |
| n1060,0                                       | 1 060,00 | 1,77490 | Knoop Hardness   | KH       | 287,00 | T 440   | 0,931   |          |
| <u>Thermal Properties</u>                     |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 0,70   | T 550   | 0,996   |          |
| Transformation<br>Temperature, C              | Tg       | 415     | <u>Temperature Coefficient of Refractive Index</u>     |          |        | T 640   | 0,995   |          |
| Expansion<br>Coefficient, 10 <sup>-7</sup> /C | Alpha    | 81      |  |          |        | Range of Temperature, C: - 60 ... 20, C'-Line | NTabs   | 65       |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 93     | <u>Other Properties</u>                       |         |          |
|   |          |         |  |          |        | Bubble  | B       | 5        |
|   |          |         |  |          |        | Farbcode                                      | FC      | 43\39    |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>109</b>   |          |        | <b>4 492 355 000</b>                          |         |          |



| DATA SHEET   |          |         | TF11  |          |       | 648 315                             |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,64878 | Abbe Number   | Vd       | 31,59 | Dispersion                          | nF-nC   | 0,020540 |
|  | ne       | 1,65362 |   | Ve       | 31,34 |                                     | nF'-nC' | 0,020858 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,70784 | nF-nC   | 0,020540 |       | Pe (i,h)                            | 1,0100  |          |
| nh   | 404,66   | 1,68677 | nF'-nC'   | 0,020858 |       | Pe (h,g)                            | 0,5297  |          |
| ng   | 435,83   | 1,67572 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,5325  |          |
| nF'  | 479,99   | 1,66461 | delta Pe (i,F')                                     | 0,1070   |       | Pe (F',e)                           | 0,5271  |          |
| n488,0   | 488,00   | 1,66299 | delta Pe (g,F')                                     | 0,0086   |       | Pe (e,d)                            | 0,2321  |          |
| ne   | 546,07   | 1,65362 | delta Pe (F',e)                                     | 0,0021   |       | Pe (d,C')                           | 0,2408  |          |
| nd   | 587,56   | 1,64878 | delta Pe (F',r)                                     | 0,0012   |       | Pe (e,C')                           | 0,4729  |          |
| n632,8   | 632,80   | 1,64461 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,2030  |          |
| nC'  | 643,85   | 1,64376 | Water Resistance                                    | WRs      | A     | Pe (r,s)                            | 0,3140  |          |
| n694,3   | 694,30   | 1,64025 | Acide Resistance                                    | AR*      | 2     | Pe (s,t)                            | 0,2190  |          |
| nr   | 706,52   | 1,63952 | <u>Internal Transmittance</u>                       |          |       | 10 mm                               |         |          |
| ns   | 852,10   | 1,63298 |   |          |       | T 365                               | .       |          |
| nt   | 1 013,90 | 1,62842 |   |          |       | T 400                               | 0,848   |          |
| n1060,0  | 1 060,00 | 1,62739 |   |          |       | T 440                               | 0,957   |          |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |       | T 550                               | 0,989   |          |
| Transformation Temperature, C                      | Tg       | 425     | Density, g\c.cm.                                    | SG       | 3,14  | T 640                               | 0,984   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 107     | Grindability  | HG       | HG2   | Ta                                  | 0,989   |          |
|  |          |         | Knoop Hardness                                      | KH       | -     |                                     |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 2,85  |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | -42      |       | Bubble                              | B       | 5        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | -27      |       | Farbcode                            | FC      | 40\38    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>78</b>   |          |       | <b>4 492 357 000</b>                |         |          |

| DATA SHEET   |          |         | TF12  |          |           | 785 256                             |         |          |
|--|----------|---------|---|----------|-----------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,78516 | Abbe Number   | Vd       | 25,67     | Dispersion                          | nF-nC   | 0,030590 |
|  | ne       | 1,79238 |   | Ve       | 25,46     |                                     | nF'-nC' | 0,031124 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | -       | nF-nC   | 0,030590 | Pe (i,h)  | -                                   |         |          |
| nh   | 404,66   | 1,84283 | nF'-nC'   | 0,031124 | Pe (h,g)  | 0,5468                              |         |          |
| ng   | 435,83   | 1,82581 | <u>Deviation of Relative Partial Dispersions</u>    |          |           | Pe (g,F')                           | 0,5437  |          |
| nF'  | 479,99   | 1,80889 | delta Pe (i,F')                                     | -        | Pe (F',e) | 0,5305                              |         |          |
| n488,0   | 488,00   | 1,80644 | delta Pe (g,F')                                     | 0,0111   | Pe (e,d)  | 0,2318                              |         |          |
| ne   | 546,07   | 1,79238 | delta Pe (F',e)                                     | 0,0021   | Pe (d,C') | 0,2377                              |         |          |
| nd   | 587,56   | 1,78516 | delta Pe (F',r)                                     | -0,0011  | Pe (e,C') | 0,4695                              |         |          |
| n632,8   | 632,80   | 1,77905 | <u>Chemical Properties</u>                          |          |           | Pe (C,r)                            | 0,1970  |          |
| nC'  | 643,85   | 1,77777 | Water Resistance                                    | WRs      | A         | Pe (r,s)                            | 0,2980  |          |
| n694,3   | 694,30   | 1,77270 | Acide Resistance                                    | AR*      | 3         | Pe (s,t)                            | 0,2000  |          |
| nr   | 706,52   | 1,77165 |   |          |           | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,76236 |   |          |           | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,75613 |   |          |           | T 365                               | -       |          |
| n1060,0  | 1 060,00 | 1,75478 |   |          |           | T 400                               | 0,223   |          |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                               | 0,812   |          |
| Transformation Temperature, C                      | Tg       | 500     | Density, g\c.cm.                                    | SG       | 4,74      | T 550                               | 0,986   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 63      | Grindability  | HG       | HG3       | T 640                               | 0,988   |          |
|  |          |         | Knoop Hardness                                      | KH       | 353,00    | Ta                                  | 0,986   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,20      |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |           | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    | 85      |   |          |           | Bubble                              | B       | 5        |
| Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    | 105     |   |          |           | Farbcode                            | FC      | 44\41    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>107</b>  |          |           | <b>4 492 358 000</b>                |         |          |

| DATA SHEET   |          |         | TF13  |          |          | 784 263                                    |         |          |
|--|----------|---------|---|----------|----------|--|---------|----------|
| Refractive Index                                   | nd       | 1,78466 | Abbe Number   | Vd       | 26,33    | Dispersion                                 | nF-nC   | 0,029800 |
|  | ne       | 1,79169 |   | Ve       | 26,13    |  | nF'-nC' | 0,030299 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |          | <u>Realative Partial Dispersions</u>       |         |          |
| ni   | 365,00   | -       | nF-nC   | 0,029800 |          | Pe (i,h)                                   | -       |          |
| nh   | 404,66   | 1,84011 | nF'-nC'   | 0,030299 |          | Pe (h,g)                                   | 0,5324  |          |
| ng   | 435,83   | 1,82398 | <u>Deviation of Realative Partial Dispersions</u>   |          |          | Pe (g,F')                                  | 0,5368  |          |
| nF'  | 479,99   | 1,80772 |   |          |          | delta Pe (i,F')                            | -       |          |
| n488,0   | 488,00   | 1,80534 | delta Pe (g,F')                                     | 0,0051   |          | Pe (e,d)                                   | 0,2322  |          |
| ne   | 546,07   | 1,79169 | delta Pe (F',e)                                     | 0,0010   |          | Pe (d,C')                                  | 0,2389  |          |
| nd   | 587,56   | 1,78466 | delta Pe (F',r)                                     | 0,0002   |          | Pe (e,C')                                  | 0,4711  |          |
| n632,8   | 632,80   | 1,77867 | <u>Chemical Properties</u>                          |          |          | Pe (C,r)                                   | 0,1980  |          |
| nC'  | 643,85   | 1,77742 |   |          |          | Water Resistance                           | WRs     | A        |
| n694,3   | 694,30   | 1,77245 | Acide Resistance                                    | AR*      | 4        | Pe (s,t)                                   | 0,2010  |          |
| nr   | 706,52   | 1,77141 | <u>Mechanical Properties</u>                        |          |          | <u>Internal Transmittance</u>              |         |          |
| ns   | 852,10   | 1,76231 |   |          |          | Density, g/c.cm.                           | SG      | 5,04     |
| nt   | 1 013,90 | 1,75622 | Grindability  | HG       | HG2      | T 365                                      | -       |          |
| n1060,0  | 1 060,00 | 1,75492 | Knoop Hardness                                      | KH       | -        | T 400                                      | 0,603   |          |
| <u>Termal Properties</u>                           |          |         | Photoelastic Coefficient, nm/cm 10 <sup>-5</sup> Pa | K        | 0,80     | T 440                                      | 0,897   |          |
|  |          |         | Transformation Temperature, C                       | Tg       | 430      | T 550                                      |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |          | T 640                                      | 0,995   |          |
|  |          |         |   |          |          | Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha   | 78       |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 52       | Bubble   |  |         | B 4      |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 91       | Farbcode |  |         | FC 42139 |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>106</b>  |          |          | <b>4 492 359 000</b>                       |         |          |

| DATA SHEET   |          |         | TF14  |          |          | 691 287                             |         |          |
|--|----------|---------|---|----------|----------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,69161 | Abbe Number   | Vd       | 28,79    | Dispersion                          | nF-nC   | 0,024020 |
|  | ne       | 1,69728 |   | Ve       | 28,56    |                                     | nF'-nC' | 0,024412 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |          | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | -       | nF-nC   | 0,024020 |          | Pe (i,h)                            | -       |          |
| nh   | 404,66   | 1,73636 | nF'-nC'   | 0,024412 |          | Pe (h,g)                            | 0,5359  |          |
| ng   | 435,83   | 1,72328 | <u>Deviation of Relative Partial Dispersions</u>    |          |          | Pe (g,F')                           | 0,5370  |          |
| nF'  | 479,99   | 1,71017 | delta Pe (i,F')                                     | -        |          | Pe (F',e)                           | 0,5281  |          |
| n488,0   | 488,00   | 1,70826 | delta Pe (g,F')                                     | 0,0090   |          | Pe (e,d)                            | 0,2322  |          |
| ne   | 546,07   | 1,69728 | delta Pe (F',e)                                     | 0,0015   |          | Pe (d,C')                           | 0,2397  |          |
| nd   | 587,56   | 1,69161 | delta Pe (F',r)                                     | -0,0009  |          | Pe (e,C')                           | 0,4719  |          |
| n632,8   | 632,80   | 1,68678 | <u>Chemical Properties</u>                          |          |          | Pe (C,r)                            | 0,1990  |          |
| nC'  | 643,85   | 1,68576 | Water Resistance                                    | WRs      | A        | Pe (r,s)                            | 0,3040  |          |
| n694,3   | 694,30   | 1,68177 | Acide Resistance                                    | AR*      | 2        | Pe (s,t)                            | 0,2130  |          |
| nr   | 706,52   | 1,68089 |   |          |          | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,67347 |   |          |          | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,66828 |   |          |          | T 365                               | 0,223   |          |
| n1060,0  | 1 060,00 | 1,66711 |   |          |          | T 400                               | 0,942   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |          | T 440                               | 0,991   |          |
| Transformation Temperature, C                      | Tg       | 505     | Density, g/c.cm.                                    | SG       | 3,00     | T 550                               | 0,998   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 100     | Grindability  | HG       | HG2      | T 640                               | 0,999   |          |
|  |          |         | Knoop Hardness                                      | KH       | -        | Ta                                  | 0,998   |          |
|  |          |         | Photoelastic Coefficient, nm/cm 10 <sup>-5</sup> Pa | K        | 3,30     |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |          | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          | NTabs   | 0   |          | Bubble   |                                     | B       | 5        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          | NTabs   | 10  |          | Farbcode |                                     | FC      | 39\37    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>90</b>   |          |          | <b>4 492 360 000</b>                |         |          |

| DATA SHEET                                  |          |         | TF15  |          |           | 769 259                             |         |          |
|---|----------|---------|---|----------|-----------|-------------------------------------|---------|----------|
| Refractive Index                            | nd       | 1,76965 | Abbe Number   | Vd       | 25,97     | Dispersion                          | nF-nC   | 0,029640 |
|   | ne       | 1,77664 |   | Ve       | 25,76     |                                     | nF'-nC' | 0,030147 |
| <u>Refractive Indices</u>                   |          |         | <u>Partial Dispersions</u>                            |          |           | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | -       | nF-nC   | 0,029640 | Pe (i,h)  | -                                   |         |          |
| nh  | 404,66   | 1,82533 | nF'-nC'   | 0,030147 | Pe (h,g)  | 0,5431                              |         |          |
| ng  | 435,83   | 1,80896 | <u>Deviation of Realative Partial Dispersions</u>     |          |           | Pe (g,F')                           | 0,5422  |          |
| nF'   | 479,99   | 1,79261 | delta Pe (i,F')                                       | -        | Pe (F',e) | 0,5298                              |         |          |
| n488,0                                      | 488,00   | 1,79024 | delta Pe (g,F')                                       | 0,01010  | Pe (e,d)  | 0,2317                              |         |          |
| ne  | 546,07   | 1,77664 | delta Pe (F',e)                                       | 0,00160  | Pe (d,C') | 0,2384                              |         |          |
| nd  | 587,56   | 1,76965 | delta Pe (F',r)                                       | 0,00010  | Pe (e,C') | 0,4701                              |         |          |
| n632,8                                      | 632,80   | 1,76371 | <u>Chemical Properties</u>                            |          |           | Pe (C,r)                            | 0,1980  |          |
| nC'   | 643,85   | 1,76246 | Water Resistance                                      | WRs      | s         | Pe (r,s)                            | 0,3030  |          |
| n694,3                                      | 694,30   | 1,75753 | Acide Resistance                                      | AR*      | 2         | Pe (s,t)                            | 0,2080  |          |
| nr  | 706,52   | 1,75650 | <u>Mechanical Properties</u>                          |          |           | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,74736 | Density, g/c.cm.                                      | SG       | 3,35      | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,74108 | Grindability  | HG       | HG1       | T 365                               | 0,079   |          |
| n1060,0                                     | 1 060,00 | 1,73969 | Knoop Hardness  | KH       | -         | T 400                               | 0,490   |          |
| <u>Termal Properties</u>                    |          |         | Photoelastic Coefficient, nm\cm 10 <sup>^</sup> -5 Pa | K        | 3,20      | T 440                               | 0,955   |          |
| Transformation Temperature, C               | Tg       | 575     | <u>Temperature Coefficient of Refractive Index</u>    |          |           | T 550                               | -       |          |
| Expansion Coefficient, 10 <sup>^-7</sup> /C | Alpha    | 93      | Range of Temperature, C: - 60 ... 20, C'-Line         | NTabs    | -26       | T 640                               | -       |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line          | NTabs    | -12       | Ta                                  | -       |          |
|   |          |         |   |          |           | <u>Other Properties</u>             |         |          |
|   |          |         |   |          |           | Bubble                              | B       | 5        |
|   |          |         |   |          |           | Farbcode                            | FC      | 41\39    |
| <b>PG&amp;F, TM (UA)</b>                    |          |         | <b>104</b>  |          |           | <b>4 492 361 000</b>                |         |          |

| DATA SHEET   |          |         | TBF3   |          |           | 755 411                             |          |          |       |
|--|----------|---------|--|----------|-----------|-------------------------------------|----------|----------|-------|
| Refractive Index                                   | nd       | 1,75586 | Abbe Number  | Vd       | 41,15     | Dispersion                          | nF-nC    | 0,018370 |       |
|  | ne       | 1,76021 |  | Ve       | 40,87     |                                     | nF'-nC'  | 0,018601 |       |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                           |          |           | <u>Relative Partial Dispersions</u> |          |          |       |
| ni   | 365,00   | 1,80419 | nF-nC  | 0,018370 | Pe (i,h)  | 0,8550                              |          |          |       |
| nh   | 404,66   | 1,78829 | nF'-nC'  | 0,018601 | Pe (h,g)  | 0,4841                              |          |          |       |
| ng   | 435,83   | 1,77928 | <u>Deviation of Relative Partial Dispersions</u>     |          |           | Pe (g,F')                           | 0,5062   |          |       |
| nF'  | 479,99   | 1,76987 | delta Pe (i,F')                                      | -0,0320  | Pe (F',e) | 0,5193                              |          |          |       |
| n488,0   | 488,00   | 1,76846 | delta Pe (g,F')                                      | -0,0035  | Pe (e,d)  | 0,2338                              |          |          |       |
| ne   | 546,07   | 1,76021 | delta Pe (F',e)                                      | -0,0004  | Pe (d,C') | 0,2469                              |          |          |       |
| nd   | 587,56   | 1,75586 | delta Pe (F',r)                                      | -0,0008  | Pe (e,C') | 0,4808                              |          |          |       |
| n632,8   | 632,80   | 1,75207 | <u>Chemical Properties</u>                           |          |           | Pe (C,r)                            | 0,2080   |          |       |
| nC'  | 643,85   | 1,75127 | Water Resistance                                     | WRs      | s         | Pe (r,s)                            | 0,3250   |          |       |
| n694,3   | 694,30   | 1,74808 | Acide Resistance                                     | AR*      | 5         | Pe (s,t)                            | 0,2280   |          |       |
| nr   | 706,52   | 1,74740 |  |          |           | <u>Internal Transmittance</u>       |          |          |       |
| ns   | 852,10   | 1,74136 |  |          |           | 10 mm                               |          |          |       |
| nt   | 1 013,90 | 1,73712 |  |          |           | T 365                               | 0,394    |          |       |
| n1060,0  | 1 060,00 | 1,73617 |  |          |           | T 400                               | 0,855    |          |       |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                         |          |           | T 440                               | 0,935    |          |       |
| Transformation Temperature, C                      | Tg       | 550     | Density, g/c.cm.                                     | SG       | 4,47      | T 550                               | 0,979    |          |       |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 75      | Grindability   | HG       | HG3       | T 640                               | 0,987    |          |       |
|  |          |         | Knoop Hardness                                       | KH       | 434,00    | Ta                                  | 0,979    |          |       |
|  |          |         | Photoelastic Coefficient, nm/lcm 10 <sup>-5</sup> Pa | K        | 2,45      |                                     |          |          |       |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |  |          |           | <u>Other Properties</u>             |          |          |       |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs  | 45       |           |                                     | Bubble   | B        | 4     |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs  | 62       |           |                                     | Farbcode | FC       | 40\37 |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>102</b>   |          |           | <b>4 492 270 000</b>                |          |          |       |

| DATA SHEET                                 |          |         | TBF4  |          |        | 778 380                                       |         |          |
|--|----------|---------|---|----------|--------|---|---------|----------|
| Refractive Index                           | nd       | 1,77878 | Abbe Number   | Vd       | 38,08  | Dispersion                                    | nF-nC   | 0,020450 |
|  | ne       | 1,78362 |   | Ve       | 37,82  |   | nF'-nC' | 0,020722 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |        | <u>Relative Partial Dispersions</u>           |         |          |
| ni   | 365,00   | 1,83373 | nF-nC   | 0,020450 |        | Pe (i,h)                                      | 0,8880  |          |
| nh   | 404,66   | 1,81533 | nF'-nC'   | 0,020722 |        | Pe (h,g)                                      | 0,4963  |          |
| ng   | 435,83   | 1,80505 | <u>Deviation of Relative Partial Dispersions</u>    |          |        | Pe (g,F')                                     | 0,5128  |          |
| nF'  | 479,99   | 1,79442 |   |          |        | delta Pe (i,F')                               | -0,0080 |          |
| n488,0                                     | 488,00   | 1,79284 | delta Pe (g,F')                                     | -0,0014  |        | Pe (e,d)                                      | 0,2337  |          |
| ne   | 546,07   | 1,78362 | delta Pe (F',e)                                     | -0,0001  |        | Pe (d,C')                                     | 0,2452  |          |
| nd   | 587,56   | 1,77878 | delta Pe (F',r)                                     | -0,0002  |        | Pe (e,C')                                     | 0,4788  |          |
| n632,8                                     | 632,80   | 1,77459 | <u>Chemical Properties</u>                          |          |        | Pe (C,r)                                      | 0,2060  |          |
| nC'  | 643,85   | 1,77370 |   |          |        | Water Resistance                              | WRs     | s        |
| n694,3                                     | 694,30   | 1,77017 | Acide Resistance                                    | AR*      | 4      | Pe (s,t)                                      | 0,2280  |          |
| nr   | 706,52   | 1,76942 | <u>Mechanical Properties</u>                        |          |        | <u>Internal Transmittance</u>                 |         |          |
| ns   | 852,10   | 1,76272 |   |          |        | Density, glc.cm.                              | SG      | 4,46     |
| nt   | 1 013,90 | 1,75799 | Grindability  | HG       | HG3    | T 365   | -       |          |
| n1060,0                                    | 1 060,00 | 1,75692 | Knoop Hardness                                      | KH       | 450,00 | T 400   | 0,725   |          |
| <u>Thermal Properties</u>                  |          |         | Photoelastic Coefficient, nm/cm 10 <sup>-5</sup> Pa | K        | 2,35   | T 440   | 0,911   |          |
| Transformation Temperature, C              | Tg       | 560     | <u>Temperature Coefficient of Refractive Index</u>  |          |        | T 550   | 0,988   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 75      |   |          |        | Range of Temperature, C: - 60 ... 20, C'-Line | NTabs   | 42       |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 61     | Ta  | 0,988   |          |
|  |          |         | <u>Other Properties</u>                             |          |        | Bubble  | B       | 4        |
|  |          |         |   |          |        | Farbcode                                      | FC      | 40\38    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>105</b>  |          |        | <b>4 492 271 000</b>                          |         |          |

| DATA SHEET                                     |          |         | TBF8   |          |       | 858 366                              |         |          |
|--|----------|---------|--|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                               | nd       | 1,85850 | Abbe Number  | Vd       | 36,64 | Dispersion                           | nF-nC   | 0,023430 |
|  | ne       | 1,86406 |  | Ve       | 36,40 |                                      | nF'-nC' | 0,023736 |
| <u>Refractive Indices</u>                      |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | 1,92135 | nF-nC  | 0,023430 |       | Pe (i,h)                             | 0,8890  |          |
| nh   | 404,66   | 1,90026 | nF'-nC'  | 0,023736 |       | Pe (h,g)                             | 0,4926  |          |
| ng   | 435,83   | 1,88857 | <u>Deviation of Realative Partial Dispersions</u>      |          |       | Pe (g,F')                            | 0,5118  |          |
| nF'  | 479,99   | 1,87642 | delta Pe (i,F')  | -0,0260  |       | Pe (F',e)                            | 0,5208  |          |
| n488,0   | 488,00   | 1,87461 | delta Pe (g,F')  | -0,0046  |       | Pe (e,d)                             | 0,2340  |          |
| ne   | 546,07   | 1,86406 | delta Pe (F',e)  | -0,0013  |       | Pe (d,C')                            | 0,2452  |          |
| nd   | 587,56   | 1,85850 | delta Pe (F',r)  | 0,0020   |       | Pe (e,C')                            | 0,4792  |          |
| n632,8   | 632,80   | 1,85369 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                             | 0,2070  |          |
| nC'  | 643,85   | 1,85268 | Water Resistance                                       | WRs      | s     | Pe (r,s)                             | 0,3260  |          |
| n694,3   | 694,30   | 1,84861 | Acide Resistance                                       | AR*      | 4     | Pe (s,t)                             | 0,2310  |          |
| nr   | 706,52   | 1,84776 | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>        |         |          |
| ns   | 852,10   | 1,84003 | Density, g/c.cm.                                       | SG       | 4,93  | 10 mm                                |         |          |
| nt   | 1 013,90 | 1,83454 | Grindability   | HG       | HG4   | T 365                                | 0,780   |          |
| n1060,0  | 1 060,00 | 1,83330 | Knoop Hardness   | KH       | -     | T 400                                | 0,939   |          |
| <u>Termal Properties</u>                       |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 2,45  | T 440                                | 0,977   |          |
| Transformation<br>Temperature, C               | Tg       | 615     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550                                | 0,995   |          |
| Exspansion<br>Coefficient, 10 <sup>-7</sup> /C | Alpha    | 68      | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | 21    | T 640                                | 0,995   |          |
|  |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 42    | Ta                                   | 0,995   |          |
|  |          |         | <u>Other Properties</u>                                |          |       | Bubble                               | B       | 4        |
|  |          |         |  |          |       | Farbcode                             | FC      | 40\37    |
| <b>PG&amp;F, TM (UA)</b>                       |          |         | <b>114</b>   |          |       | <b>4 492 274 000</b>                 |         |          |



| DATA SHEET                                 |          |         | TBF9  |          |       | 808 427                                       |         |          |
|--|----------|---------|---|----------|-------|---|---------|----------|
| Refractive Index                           | nd       | 1,80846 | Abbe Number   | Vd       | 42,78 | Dispersion                                    | nF-nC   | 0,018900 |
|  | ne       | 1,81296 |   | Ve       | 42,52 |   | nF'-nC' | 0,019118 |
| <u>Refractive Indices</u>                  |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u>           |         |          |
| ni   | 365,00   | 1,85712 | nF-nC   | 0,018900 |       | Pe (i,h)                                      | 0,8220  |          |
| nh   | 404,66   | 1,84140 | nF'-nC'   | 0,019118 |       | Pe (h,g)                                      | 0,4707  |          |
| ng   | 435,83   | 1,83240 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                                     | 0,4999  |          |
| nF'  | 479,99   | 1,82284 |   |          |       | delta Pe (i,F')                               | -0,0690 |          |
| n488,0                                     | 488,00   | 1,82141 | delta Pe (g,F')                                     | -0,0074  |       | Pe (e,d)                                      | 0,2352  |          |
| ne   | 546,07   | 1,81296 | delta Pe (F',e)                                     | -0,0017  |       | Pe (d,C')                                     | 0,2479  |          |
| nd   | 587,56   | 1,80846 | delta Pe (F',r)                                     | 0,0012   |       | Pe (e,C')                                     | 0,4831  |          |
| n632,8                                     | 632,80   | 1,80456 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                                      | 0,2110  |          |
| nC'  | 643,85   | 1,80373 |   |          |       | Water Resistance                              | WRs     | s        |
| n694,3                                     | 694,30   | 1,80039 | Acide Resistance                                    | AR*      | 4     | <u>Internal Transmittance</u>                 |         |          |
| nr   | 706,52   | 1,79969 | <u>Mechanical Properties</u>                        |          |       | 10 mm   |         |          |
| ns   | 852,10   | 1,79331 |   |          |       | Density, g/c.cm.                              | SG      | 5,02     |
| nt   | 1 013,90 | 1,78872 | Grindability  | HG       | HG3   | T 400   | 0,939   |          |
| n1060,0                                    | 1 060,00 | 1,78768 | Knoop Hardness                                      | KH       | -     | T 440   | 0,977   |          |
| <u>Thermal Properties</u>                  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,80  | T 550   | 0,995   |          |
| Transformation Temperature, C              | Tg       | 690     | <u>Temperature Coefficient of Refractive Index</u>  |          |       | T 640   | 0,995   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C | Alpha    | 68      |   |          |       | Range of Temperature, C: - 60 ... 20, C'-Line | NTabs   | 21       |
| <u>Other Properties</u>                    |          |         | Range of Temperature, C: 20 ... 120, C'-Line        | NTabs    | 42    | Bubble  | B       | 4        |
|  |          |         |   |          |       | Farbcode                                      | FC      | 36\34    |
| <b>PG&amp;F, TM (UA)</b>                   |          |         | <b>110</b>  |          |       | <b>4 492 275 000</b>                          |         |          |

| DATA SHEET   |          |         | TBF10   |          |       | 814 334                              |         |          |           |        |
|--|----------|---------|---|----------|-------|--------------------------------------|---------|----------|-----------|--------|
| Refractive Index                                   | nd       | 1,81481 | Abbe Number   | Vd       | 33,42 | Dispersion                           | nF-nC   | 0,024380 |           |        |
|  | ne       | 1,82057 |   | Ve       | 33,17 |                                      | nF'-nC' | 0,024740 |           |        |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Realative Partial Dispersions</u> |         |          |           |        |
| ni   | 365,00   | 1,88303 | nF-nC   | 0,024380 |       | Pe (i,h)                             | 0,9600  |          |           |        |
| nh   | 404,66   | 1,85928 | nF'-nC'   | 0,024740 |       | Pe (h,g)                             | 0,5152  |          |           |        |
| ng   | 435,83   | 1,84653 | <u>Deviation of Realative Partial Dispersions</u>   |          |       | Pe (g,F')                            | 0,5248  |          |           |        |
| nF'  | 479,99   | 1,83355 |   |          |       | delta Pe (i,F')                      | 0,0510  |          | Pe (F',e) | 0,5245 |
| n488,0   | 488,00   | 1,83163 | delta Pe (g,F')                                     | 0,0036   |       | Pe (e,d)                             | 0,2330  |          |           |        |
| ne   | 546,07   | 1,82057 | delta Pe (F',e)                                     | 0,0005   |       | Pe (d,C')                            | 0,2425  |          |           |        |
| nd   | 587,56   | 1,81481 | delta Pe (F',r)                                     | 0,0001   |       | Pe (e,C')                            | 0,4755  |          |           |        |
| n632,8   | 632,80   | 1,80985 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                             | 0,2030  |          |           |        |
| nC'  | 643,85   | 1,80881 |   |          |       | Water Resistance                     | WRs     | A        | Pe (r,s)  | 0,3160 |
| n694,3   | 694,30   | 1,80465 | Acide Resistance                                    | AR*      | 3     | <u>Internal Transmittance</u>        |         |          |           |        |
| nr   | 706,52   | 1,80378 |   |          |       | 10 mm                                |         |          |           |        |
| ns   | 852,10   | 1,79595 |   |          |       | T 365                                |         |          | 0,213     |        |
| nt   | 1 013,90 | 1,79045 |   |          |       | T 400                                |         |          | 0,871     |        |
| n1060,0  | 1 060,00 | 1,78921 |   |          |       | T 440                                |         |          | 0,950     |        |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |       | T 550                                |         |          | 0,992     |        |
| Transformation Temperature, C                      | Tg       | 655     | Density, g/c.cm.                                    | SG       | 4,22  | T 640                                |         |          | 0,997     |        |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 73      | Grindability  | HG       | HG3   | Ta                                   |         |          | 0,992     |        |
|  |          |         | Knoop Hardness                                      | KH       | -     |                                      |         |          |           |        |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,85  |                                      |         |          |           |        |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>              |         |          |           |        |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 13       |       | Bubble                               | B       | 5        |           |        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 30       |       | Farbcode                             | FC      | 39\37    |           |        |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>112</b>  |          |       | <b>4 492 277 000</b>                 |         |          |           |        |

| DATA SHEET   |          |         | TBF11   |          |           | 832 430                              |         |          |       |
|--|----------|---------|---|----------|-----------|--------------------------------------|---------|----------|-------|
| Refractive Index                                   | nd       | 1,83277 | Abbe Number   | Vd       | 43,08     | Dispersion                           | nF-nC   | 0,019330 |       |
|  | ne       | 1,83737 |   | Ve       | 42,83     |                                      | nF'-nC' | 0,019550 |       |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Realative Partial Dispersions</u> |         |          |       |
| ni   | 365,00   | 1,88241 | nF-nC   | 0,019330 | Pe (i,h)  | 0,8180                               |         |          |       |
| nh   | 404,66   | 1,86641 | nF'-nC'   | 0,019550 | Pe (h,g)  | 0,4700                               |         |          |       |
| ng   | 435,83   | 1,85722 | <u>Deviation of Realative Partial Dispersions</u>   |          |           | Pe (g,F')                            | 0,4989  |          |       |
| nF'  | 479,99   | 1,84747 | delta Pe (i,F')                                     | -0,0710  | Pe (F',e) | 0,5167                               |         |          |       |
| n488,0   | 488,00   | 1,84601 | delta Pe (g,F')                                     | -0,0079  | Pe (e,d)  | 0,2351                               |         |          |       |
| ne   | 546,07   | 1,83737 | delta Pe (F',e)                                     | -0,0018  | Pe (d,C') | 0,2482                               |         |          |       |
| nd   | 587,56   | 1,83277 | delta Pe (F',r)                                     | 0,0015   | Pe (e,C') | 0,4833                               |         |          |       |
| n632,8   | 632,80   | 1,82876 | <u>Chemical Properties</u>                          |          |           | Pe (C,r)                             | 0,2120  |          |       |
| nC'  | 643,85   | 1,82792 | Water Resistance                                    | WRs      | s         | Pe (r,s)                             | 0,3340  |          |       |
| n694,3   | 694,30   | 1,82450 | Acide Resistance                                    | AR*      | 4         | Pe (s,t)                             | 0,2390  |          |       |
| nr   | 706,52   | 1,82378 |   |          |           | <u>Internal Transmittance</u>        |         |          |       |
| ns   | 852,10   | 1,81725 |   |          |           |                                      | 10 mm   |          |       |
| nt   | 1 013,90 | 1,81257 |   |          |           | T 365                                | 0,683   |          |       |
| n1060,0  | 1 060,00 | 1,81150 |   |          |           | T 400                                | 0,928   |          |       |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                                | 0,974   |          |       |
| Transformation Temperature, C                      | Tg       | 650     | Density, g/c.cm.                                    | SG       | 5,07      | T 550                                | 0,995   |          |       |
| Exspansion Coefficient, 10 <sup>-7</sup> /C        | Alpha    | 64      | Grindability  | HG       | HG1       | T 640                                | 0,996   |          |       |
|  |          |         | Knoop Hardness                                      | KH       | -         | Ta                                   | 0,995   |          |       |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,70      |                                      |         |          |       |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |           | <u>Other Properties</u>              |         |          |       |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 47       | Bubble    |                                      |         | B        | 4     |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 72       | Farbcode  |                                      |         | FC       | 37\35 |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>113</b>  |          |           | <b>4 492 278 000</b>                 |         |          |       |

| DATA SHEET                                    |          |         | TBF13  |          |       | 882 335                                      |         |          |
|---|----------|---------|--|----------|-------|--|---------|----------|
| Refractive Index                              | nd       | 1,88253 | Abbe Number  | Vd       | 33,54 | Dispersion                                   | nF-nC   | 0,026310 |
|   | ne       | 1,88876 |  | Ve       | 33,30 |  | nF'-nC' | 0,026689 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                           |          |       | <u>Relative Partial Dispersions</u>          |         |          |
| ni  | 365,00   | 1,95508 | nF-nC  | 0,026310 |       | Pe (i,h)                                     | 0,9350  |          |
| nh  | 404,66   | 1,93013 | nF'-nC'  | 0,026689 |       | Pe (h,g)                                     | 0,5059  |          |
| ng  | 435,83   | 1,91663 | <u>Deviation of Relative Partial Dispersions</u>     |          |       | Pe (g,F')                                    | 0,5207  |          |
| nF'   | 479,99   | 1,90273 |  |          |       | delta Pe (i,F')                              | 0,0140  |          |
| n488,0  | 488,00   | 1,90068 | delta Pe (g,F')                                      | -0,0003  |       | Pe (e,d)                                     | 0,2334  |          |
| ne  | 546,07   | 1,88876 | delta Pe (F',e)                                      | -0,0004  |       | Pe (d,C')                                    | 0,2431  |          |
| nd  | 587,56   | 1,88253 | delta Pe (F',r)                                      | 0,0007   |       | Pe (e,C')                                    | 0,4765  |          |
| n632,8  | 632,80   | 1,87717 | <u>Chemical Properties</u>                           |          |       | Pe (C,r)                                     | 0,2040  |          |
| nC'   | 643,85   | 1,87604 |  |          |       | Water Resistance                             | WRs     | s        |
| n694,3  | 694,30   | 1,87154 | Acide Resistance                                     | AR*      | 3     | <u>Internal Transmittance</u>                |         |          |
| nr  | 706,52   | 1,87060 | <u>Mechanical Properties</u>                         |          |       | 10 mm  |         |          |
| ns  | 852,10   | 1,96207 |  |          |       | Density, g/c.cm.                             | SG      | 4,53     |
| nt  | 1 013,90 | 1,85606 | Grindability   | HG       | HG4   | T 400  | 0,708   |          |
| n1060,0                                       | 1 060,00 | 1,85470 | Knoop Hardness                                       | KH       | -     | T 440  | 0,871   |          |
| <u>Termal Properties</u>                      |          |         | Photoelastic Coefficient, nm/lcm 10 <sup>-5</sup> Pa | K        | 1,60  | T 550  | 0,969   |          |
| Transformation Temperature, C                 | Tg       | 645     | <u>Temperature Coefficient of Refractive Index</u>   |          |       | T 640  | 0,991   |          |
| Exspansion Coefficient, 10 <sup>-7</sup> /C   | Alpha    | 69      |  |          |       | <u>Other Properties</u>                      |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line |          |         | NTabs 38   |          |       |  |         |          |
|   |          |         |  |          |       | Range of Temperature, C: 20 ... 120, C'-Line |         |          |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>115</b>   |          |       |  |         |          |

| DATA SHEET                                    |          |         | TBF14  |          |           | 953 248                             |         |          |
|---|----------|---------|--|----------|-----------|-------------------------------------|---------|----------|
| Refractive Index                              | nd       | 1,95334 | Abbe Number  | Vd       | 24,81     | Dispersion                          | nF-nC   | 0,038430 |
|   | ne       | 1,96239 |  | Ve       | 24,62     |                                     | nF'-nC' | 0,039083 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |           | <u>Relative Partial Dispersions</u> |         |          |
| ni  | 365,00   | -       | nF-nC  | 0,038430 | Pe (i,h)  | -                                   |         |          |
| nh  | 404,66   | 2,02504 | nF'-nC'  | 0,039083 | Pe (h,g)  | 0,5344                              |         |          |
| ng  | 435,83   | 2,00415 | <u>Deviation of Relative Partial Dispersions</u>       |          |           | Pe (g,F')                           | 0,5389  |          |
| nF'   | 479,99   | 1,98309 | delta Pe (i,F')  | -        | Pe (F',e) | 0,5297                              |         |          |
| n488,0  | 488,00   | 1,98002 | delta Pe (g,F')  | 0,0050   | Pe (e,d)  | 0,2317                              |         |          |
| ne  | 546,07   | 1,96239 | delta Pe (F',e)  | 0,0008   | Pe (d,C') | 0,2386                              |         |          |
| nd  | 587,56   | 1,95334 | delta Pe (F',r)  | -0,0002  | Pe (e,C') | 0,4703                              |         |          |
| n632,8  | 632,80   | 1,94562 | <u>Chemical Properties</u>                             |          |           | Pe (C,r)                            | 0,1970  |          |
| nC'   | 643,85   | 1,94401 | Water Resistance                                       | WRs      | s         | Pe (r,s)                            | 0,2940  |          |
| n694,3  | 694,30   | 1,93767 | Acide Resistance                                       | AR*      | 4         | Pe (s,t)                            | 0,1930  |          |
| nr  | 706,52   | 1,93632 | <u>Mechanical Properties</u>                           |          |           | <u>Internal Transmittance</u>       |         |          |
| ns  | 852,10   | 1,92482 | Density, g/c.cm.                                       | SG       | 4,95      | 10 mm                               |         |          |
| nt  | 1 013,90 | 1,91727 | Grindability   | HG       | HG1       | T 365                               | -       |          |
| n1060,0                                       | 1 060,00 | 1,91567 | Knoop Hardness   | KH       | -         | T 400                               | 0,447   |          |
| <u>Termal Properties</u>                      |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | -         | T 440                               | 0,794   |          |
| Transformation<br>Temperature, C              | Tg       | 420     | <u>Temperature Coefficient of Refractive Index</u>     |          |           | T 550                               | 0,981   |          |
| Expansion Coefficient,<br>10 <sup>-7</sup> /C | Alpha    | 111     | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | -8        | T 640                               | 0,998   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 32        | Ta                                  | 0,981   |          |
|   |          |         |  |          |           | <u>Other Properties</u>             |         |          |
|   |          |         |  |          |           | Bubble                              | B       | 5        |
|   |          |         |  |          |           | Farbcode                            | FC      | 45\40    |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>118</b>   |          |           | <b>4 492 281 000</b>                |         |          |

| DATA SHEET   |          |         | TBF25   |          |           | 812 374                              |         |          |
|--|----------|---------|---|----------|-----------|--------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,81239 | Abbe Number   | Vd       | 37,45     | Dispersion                           | nF-nC   | 0,021690 |
|  | ne       | 1,81753 |   | Ve       | 37,21     |                                      | nF'-nC' | 0,021973 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |           | <u>Realative Partial Dispersions</u> |         |          |
| ni   | 365,00   | -       | nF-nC   | 0,021690 | Pe (i,h)  | -                                    |         |          |
| nh   | 404,66   | 1,85114 | nF'-nC'   | 0,021973 | Pe (h,g)  | 0,4955                               |         |          |
| ng   | 435,83   | 1,84025 | <u>Deviation of Realative Partial Dispersions</u>   |          |           | Pe (g,F')                            | 0,5133  |          |
| nF'  | 479,99   | 1,82897 | delta Pe (i,F')                                     | -        | Pe (F',e) | 0,5207                               |         |          |
| n488,0   | 488,00   | 1,82730 | delta Pe (g,F')                                     | -0,0019  | Pe (e,d)  | 0,2341                               |         |          |
| ne   | 546,07   | 1,81753 | delta Pe (F',e)                                     | -0,0010  | Pe (d,C') | 0,2453                               |         |          |
| nd   | 587,56   | 1,81239 | delta Pe (F',r)                                     | 0,0019   | Pe (e,C') | 0,4793                               |         |          |
| n632,8   | 632,80   | 1,80793 | <u>Chemical Properties</u>                          |          |           | Pe (C,r)                             | 0,2080  |          |
| nC'  | 643,85   | 1,80700 | Water Resistance                                    | WRs      | s         | Pe (r,s)                             | 0,3280  |          |
| n694,3   | 694,30   | 1,80322 | Acide Resistance                                    | AR*      | 4         | Pe (s,t)                             | 0,2350  |          |
| nr   | 706,52   | 1,80243 |   |          |           | <u>Internal Transmittance</u>        |         |          |
| ns   | 852,10   | 1,79522 |   |          |           | 10 mm                                |         |          |
| nt   | 1 013,90 | 1,79006 |   |          |           | T 365                                | -       |          |
| n1060,0  | 1 060,00 | 1,78888 |   |          |           | T 400                                | 0,312   |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |           | T 440                                | 0,968   |          |
| Transformation Temperature, C                      | Tg       | 605     | Density, g/c.cm.                                    | SG       | 4,48      | T 550                                | 0,994   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 66      | Grindability  | HG       | HG4       | T 640                                | 0,997   |          |
|  |          |         | Knoop Hardness                                      | KH       | -         | Ta                                   | 0,994   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | 1,85      | <u>Other Properties</u>              |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |           | Bubble                               | B       | 5        |
| Range of Temperature, C: - 60 ... 20, C'-Line      | NTabs    | 53      |   |          |           | Farbcode                             | FC      | 45\40    |
| Range of Temperature, C: 20 ... 120, C'-Line       | NTabs    | 74      |   |          |           |                                      |         |          |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>111</b>  |          |           | <b>4 492 276 000</b>                 |         |          |

| DATA SHEET                                    |          |         | TBF512   |          |       | 945 226                              |         |          |
|---|----------|---------|--|----------|-------|--------------------------------------|---------|----------|
| Refractive Index                              | nd       | 1,94586 | Abbe Number  | Vd       | 22,66 | Dispersion                           | nF-nC   | 0,041750 |
|   | ne       | 1,95573 |  | Ve       | 22,49 |                                      | nF'-nC' | 0,042491 |
| <u>Refractive Indices</u>                     |          |         | <u>Partial Dispersions</u>                             |          |       | <u>Realative Partial Dispersions</u> |         |          |
| ni  | 365,00   | -       | nF-nC  | 0,041750 |       | Pe (i,h)                             | -       |          |
| nh  | 404,66   | 2,02484 | nF'-nC'  | 0,042491 |       | Pe (h,g)                             | 0,5484  |          |
| ng  | 435,83   | 2,00154 | <u>Deviation of Realative Partial Dispersions</u>      |          |       | Pe (g,F')                            | 0,5470  |          |
| nF'   | 479,99   | 1,97830 | delta Pe (i,F')  | -        |       | Pe (F',e)                            | 0,5310  |          |
| n488,0  | 488,00   | 1,97496 | delta Pe (g,F')  | 0,0100   |       | Pe (e,d)                             | 0,2323  |          |
| ne  | 546,07   | 1,95573 | delta Pe (F',e)  | 0,0009   |       | Pe (d,C')                            | 0,2367  |          |
| nd  | 587,56   | 1,94586 | delta Pe (F',r)  | -0,0015  |       | Pe (e,C')                            | 0,4689  |          |
| n632,8  | 632,80   | 1,93754 | <u>Chemical Properties</u>                             |          |       | Pe (C,r)                             | 0,1940  |          |
| nC'   | 643,85   | 1,93580 | Water Resistance                                       | WRs      | s     | Pe (r,s)                             | 0,2980  |          |
| n694,3  | 694,30   | 1,92890 | Acide Resistance                                       | AR*      | 6     | Pe (s,t)                             | 0,1970  |          |
| nr  | 706,52   | 1,92756 | <u>Mechanical Properties</u>                           |          |       | <u>Internal Transmittance</u>        |         |          |
| ns  | 852,10   | 1,91488 | Density, g/c.cm.                                       | SG       | 6,23  | 10 mm                                |         |          |
| nt  | 1 013,90 | 1,90652 | Grindability   | HG       | HG2   | T 365                                | 0,001   |          |
| n1060,0                                       | 1 060,00 | 1,90472 | Knoop Hardness   | KH       | -     | T 400                                | 0,480   |          |
| <u>Termal Properties</u>                      |          |         | Photoelastic Coefficient,<br>nm\cm 10 <sup>-5</sup> Pa | K        | 1,15  | T 440                                | 0,790   |          |
| Transformation<br>Temperature, C              | Tg       | 375     | <u>Temperature Coefficient of Refractive Index</u>     |          |       | T 550                                | 0,980   |          |
| Expansion Coefficient,<br>10 <sup>-7</sup> /C | Alpha    | 90      | Range of Temperature, C: - 60 ... 20, C'-Line          | NTabs    | 102   | T 640                                | 0,980   |          |
|   |          |         | Range of Temperature, C: 20 ... 120, C'-Line           | NTabs    | 130   | Ta                                   | 0,980   |          |
|   |          |         |  |          |       | <u>Other Properties</u>              |         |          |
|   |          |         |  |          |       | Bubble                               | B       | 5        |
|   |          |         |  |          |       | Farbcode                             | FC      | 44\40    |
| <b>PG&amp;F, TM (UA)</b>                      |          |         | <b>117</b>   |          |       | <b>4 492 280 000</b>                 |         |          |

| DATA SHEET   |          |         | CTF2   |          |           | 944 204                             |         |          |
|--|----------|---------|--|----------|-----------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 1,94449 | Abbe Number  | Vd       | 20,42     | Dispersion                          | nF-nC   | 0,046260 |
|  | ne       | 1,95537 |  | Ve       | 20,26     |                                     | nF'-nC' | 0,047160 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                           |          |           | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | -       | nF-nC  | 0,046260 | Pe (i,h)  | -                                   |         |          |
| nh   | 404,66   | -       | nF'-nC'  | 0,047160 | Pe (h,g)  | -                                   |         |          |
| ng   | 435,83   | 2,00695 |  |          | Pe (g,F') | 0,5586                              |         |          |
| nF'  | 479,99   | 1,98061 | <u>Deviation of Relative Partial Dispersions</u>     |          |           | Pe (F',e)                           | 0,5351  |          |
| n488,0   | 488,00   | 1,97683 | delta Pe (i,F')                                      | -        | Pe (e,d)  | 0,2306                              |         |          |
| ne   | 546,07   | 1,95537 | delta Pe (g,F')                                      | 0,01830  | Pe (d,C') | 0,2343                              |         |          |
| nd   | 587,56   | 1,94449 | delta Pe (F',e)                                      | 0,00380  | Pe (e,C') | 0,4649                              |         |          |
| n632,8   | 632,80   | 1,93534 | delta Pe (F',r)                                      | -0,00200 | Pe (C,r)  | 0,1920                              |         |          |
| nC'  | 643,85   | 1,93345 | <u>Chemical Properties</u>                           |          |           | Pe (r,s)                            | 0,2850  |          |
| n694,3   | 694,30   | 1,92596 | Water Resistance                                     | WRs      | B         | Pe (s,t)                            | 0,1850  |          |
| nr   | 706,52   | 1,92442 | Acide Resistance                                     | AR*      | 5         | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 1,91095 |  |          |           | 10 mm                               |         |          |
| nt   | 1 013,90 | 1,90222 |  |          |           | T 365                               | -       |          |
| n1060,0  | 1 060,00 | 1,90039 |  |          |           | T 400                               | -       |          |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                         |          |           | T 440                               | 0,375   |          |
| Transformation Temperature, C                      | Tg       | 375     | Density, g/c.cm.                                     | SG       | 6,15      | T 550                               | 0,950   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 89      | Grindability   | HG       | HG2       | T 640                               | 0,968   |          |
|  |          |         | Knoop Hardness                                       | KH       | -         | Ta                                  | 0,950   |          |
|  |          |         | Photoelastic Coefficient, nm/lcm 10 <sup>-5</sup> Pa | K        | -1,30     |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                              |          |           |                                     |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs  | -32      |           | Bubble                              | B       | 4        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs  | 17       |           | Farbcode                            | FC      | 50\45    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>116</b>   |          |           | <b>4 492 366 000</b>                |         |          |



| DATA SHEET   |          |         | CTF3  |          |       | 1 170 170                           |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 2,17018 | Abbe Number   | Vd       | 17,03 | Dispersion                          | nF-nC   | 0,068730 |
|  | ne       | 2,18626 |   | Ve       | 16,89 |                                     | nF'-nC' | 0,070221 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | -       | nF-nC   | 0,068730 |       | Pe (i,h)                            | -       |          |
| nh   | 404,66   | -       | nF'-nC'   | 0,070221 |       | Pe (h,g)                            | -       |          |
| ng   | 435,83   | -       | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | -       |          |
| nF'  | 479,99   | 2,22420 | delta Pe (i,F')                                     | -        |       | Pe (F',e)                           | 0,5403  |          |
| n488,0   | 488,00   | 2,21846 | delta Pe (g,F')                                     | -        |       | Pe (e,d)                            | 0,2290  |          |
| ne   | 546,07   | 2,18626 | delta Pe (F',e)                                     | 0,0070   |       | Pe (d,C')                           | 0,2307  |          |
| nd   | 587,56   | 2,17018 | delta Pe (F',r)                                     | -0,0044  |       | Pe (e,C')                           | 0,4597  |          |
| n632,8   | 632,80   | 2,15675 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,1870  |          |
| nC'  | 643,85   | 2,15398 | Water Resistance                                    | WRs      | s     | Pe (r,s)                            | 0,2760  |          |
| n694,3   | 694,30   | 2,14307 | Acide Resistance                                    | AR*      | 3     | Pe (s,t)                            | 0,1750  |          |
| nr   | 706,52   | 2,14084 | <u>Internal Transmittance</u>                       |          |       | 10 mm                               |         |          |
| ns   | 852,10   | 2,12145 |   |          |       | T 365                               | -       |          |
| nt   | 1 013,90 | 2,10914 |   |          |       | T 400                               | -       |          |
| n1060,0  | 1 060,00 | 2,10658 |   |          |       | T 440                               | -       |          |
| <u>Termal Properties</u>                           |          |         | <u>Mechanical Properties</u>                        |          |       | T 550                               | 0,979   |          |
| Transformation Temperature, C                      | Tg       | 395     | Density, g/c.cm.                                    | SG       | 6,13  | T 640                               | 0,956   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 123     | Grindability  | HG       | HG1   | Ta                                  | 0,979   |          |
|  |          |         | Knoop Hardness                                      | KH       | -     |                                     |         |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | -1,40 |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         | <u>Other Properties</u>                             |          |       |                                     |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | -36      |       | Bubble                              | B       | 6        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 21       |       | Farbcode                            | FC      | 55\46    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>120</b>  |          |       | <b>4 492 367 000</b>                |         |          |

| DATA SHEET   |          |         | CTF11   |          |       | 1 056 166                           |         |          |
|--|----------|---------|---|----------|-------|-------------------------------------|---------|----------|
| Refractive Index                                   | nd       | 2,05624 | Abbe Number   | Vd       | 16,63 | Dispersion                          | nF-nC   | 0,063510 |
|  | ne       | 2,07108 |   | Ve       | 16,50 |                                     | nF'-nC' | 0,064910 |
| <u>Refractive Indices</u>                          |          |         | <u>Partial Dispersions</u>                          |          |       | <u>Relative Partial Dispersions</u> |         |          |
| ni   | 365,00   | -       | nF-nC   | 0,063510 |       | Pe (i,h)                            | -       |          |
| nh   | 404,66   | -       | nF'-nC'   | 0,064910 |       | Pe (h,g)                            | -       |          |
| ng   | 435,83   | 2,14395 | <u>Deviation of Relative Partial Dispersions</u>    |          |       | Pe (g,F')                           | 0,5812  |          |
| nF'  | 479,99   | 2,10622 | delta Pe (i,F')                                     | -        |       | Pe (F',e)                           | 0,5413  |          |
| n488,0   | 488,00   | 2,10090 | delta Pe (g,F')                                     | 0,0354   |       | Pe (e,d)                            | 0,2287  |          |
| ne   | 546,07   | 2,07108 | delta Pe (F',e)                                     | 0,0079   |       | Pe (d,C')                           | 0,2299  |          |
| nd   | 587,56   | 2,05624 | delta Pe (F',r)                                     | -0,0047  |       | Pe (e,C')                           | 0,4586  |          |
| n632,8   | 632,80   | 2,04386 | <u>Chemical Properties</u>                          |          |       | Pe (C,r)                            | 0,1860  |          |
| nC'  | 643,85   | 2,04131 | Water Resistance                                    | WRs      | u     | Pe (r,s)                            | 0,2740  |          |
| n694,3   | 694,30   | 2,03128 | Acide Resistance                                    | AR*      | 6     | Pe (s,t)                            | 0,1740  |          |
| nr   | 706,52   | 2,02921 |   |          |       | <u>Internal Transmittance</u>       |         |          |
| ns   | 852,10   | 2,01143 |   |          |       | 10 mm                               |         |          |
| nt   | 1 013,90 | 2,00012 |   |          |       | T 365                               | -       |          |
| n1060,0  | 1 060,00 | 1,99778 |   |          |       | T 400                               | -       |          |
| <u>Thermal Properties</u>                          |          |         | <u>Mechanical Properties</u>                        |          |       | T 440                               | -       |          |
| Transformation Temperature, C                      | Tg       | 305     | Density, g/c.cm.                                    | SG       | 6,79  | T 550                               | 0,910   |          |
| Expansion Coefficient, 10 <sup>-7</sup> /C         | Alpha    | 108     | Grindability  | HG       | HG1   | T 640                               | 0,956   |          |
|  |          |         | Knoop Hardness                                      | KH       | -     | Ta                                  | 0,910   |          |
|  |          |         | Photoelastic Coefficient, nm\cm 10 <sup>-5</sup> Pa | K        | -2,35 |                                     |         |          |
| <u>Temperature Coefficient of Refractive Index</u> |          |         |   |          |       | <u>Other Properties</u>             |         |          |
| Range of Temperature, C: - 60 ... 20, C'-Line      |          |         | NTabs   | 97       |       | Bubble                              | B       | 5        |
| Range of Temperature, C: 20 ... 120, C'-Line       |          |         | NTabs   | 151      |       | Farbcode                            | FC      | 55\50    |
| <b>PG&amp;F, TM (UA)</b>                           |          |         | <b>119</b>  |          |       | <b>4 492 368 000</b>                |         |          |

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