

TECH INFO: Glass N-B-SiO2

PREFACE

N-B-SiO2 glass-group collected the special glass-types, due to B₂O₃ & N₂O₃ more wt.% 32.97 are blanks for a porous glass as for porosity around wt.%30. The porousation (porouse, pores-formation, lixiviate) should be determined by your qualified physicist, e.g. then acid should be soaked for a due time with a heat.

The porous glass type is a glass with high temperature and thermal shock resistance. For example, with immersing the porous glass in certain chemical-solutions before to consolidation by temperature is produces a color glass that can withstand high temperatures without degradation. This is used for color glass filters for various designs. The porous glass is around 96% silica, but unlike Fused Silica it can be variant manufactured, att info to porous glass materials with other tech info.

GLASS-WORKS

First, a relatively soft alkali borosilicate glass is melted and formed by typical glass-works techniques into the slab forms.

Glass Attributes

Formula	sodium-boron silicate	N-B-SiO2
System	bi-phase glass structure	amorphous
SiO ₂	wt %	64.58
B ₂ O ₃	wt %	26.22
Trace element		
Na ₂ O	wt %	6.75
Al ₂ O ₃	wt %	1.96
No enter	wt %	0.49
Fe, Co, Ni, Cr, Cu	wt %	none
Absorbance	cm ⁻¹	0.001
Specific gravity	g/cm ³	2.22
Acid resistance	standard method	pores-formation

TEMPERATURE TREATMENT

Temperature treatment techniques include annealing: coarse, commercial, fine etc. Glass which has not been annealed is liable to crack or shatter when subjected to a relatively small temperature change or other shock (!). After the annealing process, this material can be machined at your product line. This is the lowest cost form of supply.

The slab is made with cast out of the glass-mass. The slab is rectangular format. The surfaces are rippled fire-polished (un-worked). Normally, the corners are made radius. Slab is annealed with coarse or fine annealing, as you orders.

GLASS N-B-SiO2 Raw

Slab	mm	no enter
Temperature treatment	anneal	coarse
Colour	clear glass	none
Porouze	standard pore 50 Å	none

TEMPERATURE SPECIAL TREATMENT

Second, Temperature special treatment is a method used to alter the physical, and sometimes chemical properties of the material. Temperature special treatment involves the use of heating to achieve a desired result, such as transformation of the glass material.

This is temperature special treatment, which causes the material to separate into two intermingled "phases" with distinct chemical compositions. One "phase" is rich in alkali and boric oxide, and can be easily dissolved in acid. The other "phase" is mostly silica, which is insoluble.

The plate, disks is blanks that are cut or core drilled from annealed slabs. These forms are generally specified when delivery is urgent and quantities are small. At this stage, the glass is still non-porous.

GLASS N-B-SiO2 Micro

Plate	mm	100x100x10
Temperature treatment	special	no enter
Colour	nonspecular glass	opaline
Porouze	micro pore 100 Å	none

GLASS N-B-SiO2 Macro

Plate	mm	60x60x6
Temperature treatment		special
Colour	nonspecular	opaline
Porouze	macro pore 1000 Å	none

GLASS N-B-SiO2 Special

Plate	mm	60x60x6
Temperature treatment	special customize	made-to-order
Colour	nonspecular glass	opaline
Porouze	special pore	none

POROUZATION

Finally, the glass is then soaked in a hot acid solution, which leaches away the soluble glass phase (lixivium), leaving an plate or disk which are mostly silica. At this stage, the glass is porous, att: once again: detailed info to porous glass materials with other tech info. Note: the porous glass is heated to more than 1200 °C, which consolidates the porous structure, making the glass shrink slightly and become non-porous. The material is classified as a "reconstructed glass". Immersing the porous glass in certain chemical solutions before the consolidation step produces a colored glass that can withstand high temperatures without degrading. This is used for colored glass filters for various applications. For some applications the consolidation step is skipped, leaving the glass porous. Such glass has a high affinity for water, and makes an excellent getter for water vapour. It is widely used in science and engineering.

RESUME

The special silicate glass due to B2O3 & N2O3 more wt.% 32.97 is glass blanks for a porous glass as for porosity around wt.%30. The porousation (porouse, pores-formation, lixiviate) should be determined by your qualified physicist, e.g. then acid should be soaked for an due time with a heat. The glass specification is Ukrainian Optical Industrial Standard: 3-1899-81. The glass is typified as follows N-B-SiO2 Raw, N-B-SiO2 Micro, N-B-SiO2 Macro, N-B-SiO2 Special.

NOTE:**Spec: 3-1899-81 Glass N-B-SiO2 Raw**

It's standard abbr ST optical quality that relates to the spec: 3-1899-81 Glass N-B-SiO2 Raw Slab, as follows. Material: sodium-boron silicate with B2O3 & N2O, WT: wt.% 32.97; Temperature treatment: coarse annealed glass with specular glass structure. The special silicate glass due to B2O3 & N2O3 more wt.%32.97 are blanks for a standard porous glass as for porosity around wt.%30, pore 50Å. At this stage, the glass is non-porous.

Spec: 3-1899-81 Glass N-B-SiO2 Micro

It's standard extra abbr SE optical quality that relates to the spec: 3-1899-81 Glass N-B-SiO2 Micro Plate 100x100x10 - in mm, as follows. Material: sodium-boron silicate with B2O3 & N2O, WT: wt.% 32.97; Temperature special treatment: striking glass with opaline nonspecular glass structure. The special silicate glass due to B2O3 & N2O3 more wt.%32.97 are blanks for a micro porous glass as for porosity around wt.%30, pore 100Å. At this stage, the glass is non-porous.

Spec: 3-1899-81 Glass N-B-SiO2 Macro

It's precise abbr PZ optical quality that relates to the spec: 3-1899-81 Glass N-B-SiO2 Macro Plate 60x60x6 - in mm, as follows. Material: sodium-boron silicate with B2O3 & N2O, WT: wt.% 32.97; Temperature special treatment: striking glass with opaline nonspecular glass structure. The special silicate glass due to B2O3 & N2O3 more wt.%32.97 are blanks for a macro porous glass as for porosity around wt.%30, pore 1000Å. At this stage, the glass is non-porous.

Spec: 3-1899-81 Glass N-B-SiO2 Special

It's super precise abbr SPZ optical quality that relates to the spec: 3-1899-81 Glass N-B-SiO2 Special Plate 60x60x6 - in mm, as follows. Material: sodium-boron silicate with B2O3 & N2O, WT: wt.% 32.97; Temperature special treatment: special customize, made-to-order glass. The special silicate glass due to B2O3 & N2O3 more wt.%32.97 are blanks for a special porous glass as for porosity around wt.%30, special pore. At this stage, the glass is non-porous.