

DATA SHEET # 9001909000

ZINC SELENIDE (ZnSe) SINGLE-CRYSTAL LASER GRADE

CRYSTAL ATTRIBUTES:

| | | |
|-----------------------|------------------|----------------|
| Formula | | ZnSe |
| Zinc Selenide | per cents, % | 99.9999 |
| Zn, zinc | per cents, % | abt 45 |
| Se, selenide | per cents, % | abt 55 |
| trace element, dopant | per cents, % | no enter |
| Colour | | amber |
| Crystal growth | technique/method | single-crystal |

This single-crystal growth process is to be started from a single seed crystal of the same material to grow the single-crystal orientation. The single-crystal is homogeneous material with no crystallites and other poly-crystal defects, e.g.: most other materials are not single-crystals; they are made as held together crystallites. All single-crystals are exceedingly rare in nature, and are also difficult as to make growth, though they can be made under controlled 'know-how' conditions. This technique involves heating an poly-crystal raw material in order to make this single-crystal growth.

Crystal growth orientation direction [111]

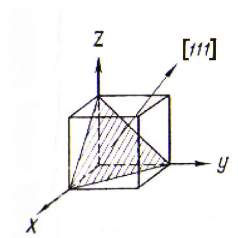


FIGURE 1.

Crystal family minerals prototype stilleite

A stilleite is selenide mineral, zinc selenide with formula ZnSe. It has been found only as microscopic crystals originally discovered in Africa, Zaire in 1956 and this mineral is named for the German geologist Hans Stille. Another zinc blende is ZnS, aka sphalerite mineral take place in nature. These two minerals form face-centered cubic lattice (FCC), altogether this same as diamond cubic system.

system cubic

The cubic (or isometric) crystal is isotropic always. Optical isotropic means having the same optical data in all crystallographic directions.

constant λ 5.6687
 cleavage plane (110) perfect

These crystal attributes are been established by the IUCr Commission on Crystallographic Nomenclature to provide definitions of terms used in the practice of crystallography. The IUCr - International Union of Crystallography, is devoted to the study of crystals, with far-reaching applications.

MECHANIC ATTRIBUTES:

| | | |
|-------------------------|--------------------------|------|
| (SG) Specific gravity | g/cm ³ | 5.26 |
| (r) Electric resistance | Ohm-cm, 10 ¹⁰ | ≥ 10 |

THERMIC ATTRIBUTES:

| | | |
|--------------------|------|-------|
| (At) Melting point | deg. | 1520° |
|--------------------|------|-------|

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OPTIC ATTRIBUTES:

| | | $\lambda, \mu\text{m}$ | |
|--|------------------|------------------------|--------------|
| (n) Index | $n_{10.6}$ | 10.6 | 2.403 |
| (τ) Internal Transmittance, 10 mm | $\tau_{10.6}$ | 10.6 | 0.891 |
| (T) Transmittance, 10 mm | $T_{10.6}$ | 10.6 | 0.720 |
| (μ) Absorbance (Attenuation coeff) | cm^{-1} | 10.6 | ≤ 0.005 |

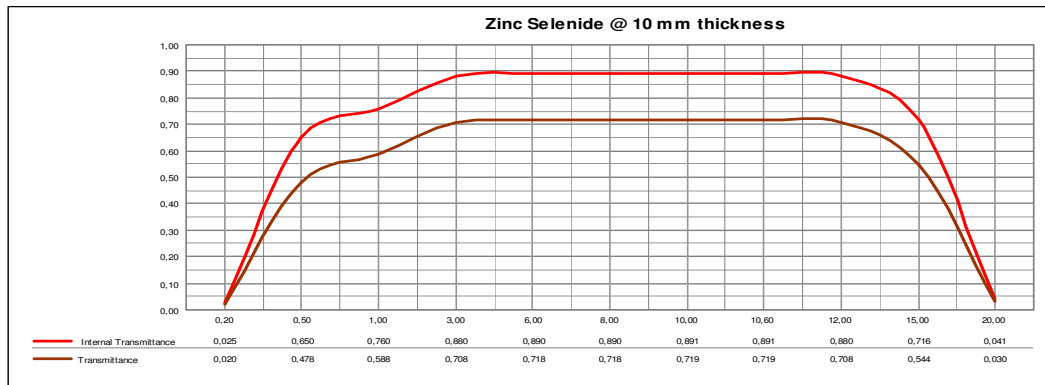


FIGURE 2.

OTHER ATTRIBUTES:

Workmanship (ST):

| | | $\lambda, \mu\text{m}$ | |
|--------------------------------|------------------|------------------------|--------------|
| supply form | | | boule |
| orientation | direction | | [111] |
| absorbance (attenuation coeff) | cm^{-1} | 10.6 | ≤ 0.005 |
| material defects | | | minor |
| supply form | | | window |
| orientation | plane | | (111) |
| SQ - surface quality | polishings | | commercial |

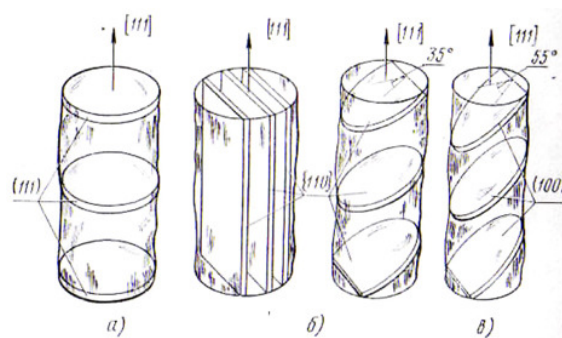


FIGURE 3.

RESUME:

The crystal system is due to 99.9999% zinc selenide. It's zinc selenide for IR-transmitter more 72% at $\lambda 10.60\mu\text{m}$. The standard is specification CAS# 1315-09-9; TARIC# 9001909000 OCT-3-191-77. The crystal is typified as follows ZnSe laser grade.