

MATERIAL SAFETY DATA SHEET (MSDS)

1. Part Description:

- Name of product: ZnSe lenses for high power CO2 lasers
- Identification code: These lenses will be recognized by p/n with /H or /HU at the end.

2. Purpose:

- This document describes the best information and technical properties we know about Thermacut's laser optics lenses.

Manufacturer/Supplier:

THERMACUT, K. S.
SOKOLOVSKÁ 574
UHERSKÉ HRADIŠTĚ - MAŘATICE
686 01, CZECH REPUBLIC

PHONE: +420 572 420 411
FAX: +420 572 420 420
SALES@THERMACUT.CZ

Remark: All the information about the raw material properties (ZnSe) of the lenses is well based on Thermacut's supplier's MSDS.

3. ZnSe Raw Material details:

3.1 Form: Solid Optical Element

3.2 Chemical family: Inorganic chemical belonging to the II-VI group of periodical system of elements.

3.3 Hazardous ingredients:

Material or component	% Atomic
Zinc	50%
Selenium	50%

3.4 Physical properties:

- Boiling point, 760 mmHg: sublimates
- Melting point: 1525 Celsius
- Specific gravity (H₂O=1): 5.27
- Solubility in H₂O, % by weight: Insoluble - Appearance and odor: yellow transparent solid, odorless

3.5 Flammability and explosive properties

Flash point (test method): Not flammable and not explosive.

3.6 Health hazard data:

3.6.1 Threshold limit value:

Material	Limit
Zinc Oxide fumes	5 mg/m ³
Zinc Oxide dust	10 mg/m ³
Selenium and compounds	0.2 mg/m ³

3.6.2 Effects of overexposure:

ZnSe - Effects are not known, but some zinc and selenium can be formed, such as:

- Zinc oxide - Chills and fever.
- Selenium and compounds - Acute exposure might produce sternal pain, cough, nausea, pallor, coated tongue, gastro-intestinal disorders, nervousness and/or conjunctivitis. A garlic odor of the breath or sweat may occur.

3.6.3 Emergency & First Aid Procedures: In dust form:

Eyes: Wash with plenty of water - See physician
Skin: Wash with plenty of water - See physician
Ingestion: Call physician.

Do not induce vomiting.

Inhalation: Remove from exposure, treat symptomatically, call physician

3.7 Reactivity data

- Stability: Stable
- Conditions to avoid:
Extreme heat greater than 500 Celsius could result in decomposition.
- Materials to avoid: Strong acids, strong bases.
- Hazardous decomposition products: Selenium/Oxides of Selenium, Zinc Oxide
- Hazardous polymerization: Will not occur.

3.8 Special protection information

(for ZnSe processing, such as machining, grinding and polishing)

In case of vaporization: Leave room and allow dust to settle. Clean all surfaces. If room has ventilation, allow for several air changes. Locate exhaust near location of ZnSe processing, or use if failure by melting is likely.

3.9 Special precautions

Handling and storage precaution: If material is to be machined, ground or polished, processes should be done wet so as to minimize dust, which could result in inhalation. Good work practices such as keeping hands clean and not letting slurry splash significantly should

be followed so that transfer to mouth by contamination on the hands or clothing followed by ingestion will not occur. Wash hands and face thoroughly after handling material and before eating. If parts are dropped or otherwise broken, sweep up pieces which may have sharp edges as one would clean up broken glass and safely transfer to disposal container.

4. Coated lens:

4.1. Maximum temperature operation: 500 deg. Celsius. Extreme heat greater than 500 deg Celsius can result decomposition.

4.2. Form: Solid optical element.

4.3 Chemical Family: Inorganic

4.4 Color: Yellow. Transparent in visible light.

4.5 Handling:

- Conditions to avoid: Acids and strong bases.
- Cleaning: Coated lens has to be cleaned with soft, wet tissue or soft, wet cloth. Cleaning the lens with rough paper or cloth might cause scratches to the coating and destroy the lens.
- Cleaning materials: For cleaning of stains or fingerprints from the coated lens, Ethanol can be used.
- Treatment before installation: The lens has to be cleaned and free of any stains or fingerprints before installation in the laser. Stain might cause high absorption and make the operation life of the lens shorter.

For further instructions, please visit our website: www.thermacut.com

4.6 Storage:

- The lenses are packed at Thermacut with Lens cleaning paper, vacuum sealed dry-shield bag and hard plastic box. It is recommended to keep the lens in the original package until the usage.
- It is recommended to keep the lenses in a low humidity conditions.
- Broken lenses: If parts are dropped or otherwise broken, sweep up pieces which may
- Have sharp edges as one would clean up broken glass and safely transfer to disposal container. Then wash your hands with water.

4.7 Disposal:

Return of Laser Optics

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of ZINC SELENIDE™. These regulations may vary by city, state, country, or geographic region. As a service to our customers, the used laser optics may be returned to Thermacut for proper disposal. Optics for disposal must be placed in a sealed plastic bag. Return authorization must be obtained prior to shipping.

Thermacut reserves the right to refuse any shipment which does not meet these guidelines.

Prepared by: Ingo Hollberg
Global Product Manager Laser

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