



MATERIAL SAFETY DATA SHEET

Environmental, Health, & Safety

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Entegris, Inc.

6975 Flanders Drive
San Diego, CA 92121
Information: 858-452-0124

CHEMTREC Emergency telephone Numbers:

United States: 800-424-9300
International: 703-527-3887 (collect)

Product Number: Entegris (O) Series Optics Gas Purifiers
Product: Entegris Optics (O) Gas Purifier media
Chemical Name: Inorganic Oxide, Nickel Oxide
Product Use: Optics gas purifier, removes moisture and other molecular impurities from Clean Dry Air, N₂, Noble Gases, O₂, O₂/Inert gas mixtures, and Lens Purge gases.

MSDS Number: 8002567
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Revision: C

SECTION 2 – COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components in the solid mixture inside the purifier body

<u>COMPONENT</u>	<u>CAS No.</u>	<u>Percent</u>
Inorganic Oxide	Proprietary	60-80
Nickel Oxide	1313-99-1	10-20

Note: See Section 8 for Exposure Limits and Section 11 for Toxicological Information

SECTION 3 – HAZARDS IDENTIFICATION AND EMERGENCY OVERVIEW

Appearance: Black extrusions, gray pellets and tan beads mixture. Odorless

Suspected Cancer Hazard: Risk of cancer depends on route, duration and level of exposure.

Health Hazards: Causes eye, skin and respiratory tract irritation. May cause allergic skin and respiratory reaction. Harmful if swallowed. May cause gastrointestinal irritation, headache, nausea, vomiting and diarrhea.

Physical Hazards: This product will remain stable when housed in the purifier body.

When the oxides are first wetted, the product can heat up to the boiling point of water. Flood with water to cool down. Repeated and prolonged inhalation of the oxides may cause cancer.

Routes of Entry:

Eyes: YES Skin: YES Inhalation: YES Ingestion: YES

Potential Health Effects:

EYE CONTACT causes irritation.

SKIN CONTACT causes irritation and may cause sensitization or allergic reactions which may be accentuated by heat and humidity. The symptoms of this NICKEL dermatitis, referred to as "nickel itch," may include an itching or burning sensation followed by the eruption of sores.

INHALATION causes upper respiratory irritation. Individuals hypersensitive to NICKEL may develop asthma, bronchitis, shortness of breath or wheezing. Prolonged or repeated overexposure to INORGANIC OXIDE may cause lung damage. Repeated and prolonged inhalation of crystalline silica in the form of quartz from occupational sources may cause cancer.

INGESTION is harmful. May cause nausea, abdominal discomfort, vomiting and diarrhea.

Carcinogenicity: Nickel Oxide

NTP: YES IARC: YES OSHA: NO

NICKEL has been classified by both the International Agency for Research on Cancer (IARC) and the National Toxicology Program (NTP) as having sufficient evidence of carcinogenicity in experimental animals. In addition, IARC has determined that there is inadequate evidence of carcinogenicity in humans (Class 2B). The American Conference of Governmental Industrial Hygienists (ACGIH) has categorized nickel as A5 (not suspected as a human carcinogen). In evaluating NICKEL COMPOUNDS, the International Agency for Research on Cancer (IARC) has determined that there is sufficient evidence of carcinogenicity to humans (Group 1). The National Toxicology Program (NTP) lists only certain nickel compounds as substances which may reasonably be anticipated to be carcinogenic. This product contains one of those nickel compounds specifically identified by NTP.

Carcinogenicity: Inorganic Oxide

NTP: YES IARC: YES OSHA: YES

The International Agency for Research on Cancer (IARC) has classified the oxides as Group 2A, "probably carcinogenic to humans." The NTP and OSHA classify Quartz as a known carcinogen.

Chronic Health Hazards:

Refer to Potential Health Effects and Carcinogenicity.

Medical Conditions Generally Aggravated by Exposure:

May aggravate existing medical conditions such as allergies, dermatitis, asthma, bronchitis or any other respiratory ailment.

NOTE: See Section 8 for Exposure Limits, Section 11 for Toxicological Information and Section 12 for Ecological Information.

SECTION 4 – FIRST AID MEASURES

In the unlikely event that the purifier media is liberated from the purifier body, these health hazards may arise from inhalation, ingestion, and or/contact with the skin and/or eyes

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin Contact: Immediately wash skin with soap and plenty of water. If irritation persists, call a physician.

Inhalation: Remove to fresh air. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician.

Ingestion: Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.

***NOTE:** Inorganic Oxide is a desiccant and generates heat as it absorbs water. The used product can contain material of hazardous nature.

SECTION 5 – FIRE-FIGHTING MEASURES

Flashpoint: Not Determined
Auto-Ignition: Not Applicable
LEL: Not Applicable
UEL: Not Applicable

NFPA Hazard Classification: Nickel Oxide: Health: 1 Flammable: 1 Reactivity: 0
HMIS Hazard Classification: Nickel Oxide: Health: 2* Flammable: 1 Reactivity: 0

* Indicates the possibility of chronic health effects. See Chronic Health Hazards in Section 3 for more information.

NFPA Hazard Classification: Inorganic Oxide: Health: 0 Flammable: 0 Reactivity: 1
HMIS Hazard Classification: Inorganic Oxide: Health: 1* Flammable: 0 Reactivity: 1

* Indicates the possibility of chronic health effects. See Chronic Health Hazards in Section 3 for more information

Extinguishing Media: Use water, carbon dioxide or foam.

Special Fire-Fighting Procedures: Wear NIOSH-certified positive-pressure self-contained breathing apparatus and protective clothing as specified in 29 CFR 1910, Subpart I.

Unusual Fire and Explosion Hazards: This product will remain stable when housed in the purifier body.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Inorganic Oxide is a desiccant and generates heat as it absorbs water. **Allow media to cool before taking any action.**

Contain spillage and scoop up or vacuum. Avoid dusting. Notification of the National Response Center (800-424-8802) may be required. Refer to EPA, DOT and applicable state and local regulations for current response information.

It is recommended that each user establish an emergency response plan as specified in 29 CFR 1910.120. Such plan should include procedures applicable to proper storage, control and clean up of spills, including reuse or disposal as appropriate (see Section 13: Disposal Consideration).

****Note**** In the unlikely event that the purifier media is liberated from the purifier body the above procedures should be followed. Additionally, proper exposure controls and personal protection equipment should be used (see Section 8: Exposure Control/Personal Protection), and disposal of the material should be in accordance with Section 13: Disposal Considerations.

SECTION 7 - HANDLING AND STORAGE

****Note**** In the unlikely event that the purifier media is liberated from the purifier body, the following procedures should be observed.

Notify Safety personnel. **Allow media to cool before taking any action.** Wash thoroughly after handling media. Keep container closed. Avoid breathing dust. Keep away from sunlight, heat or fire. Store in cool, dry location away from incompatible materials

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits Ingredients:	PEL-OSHA	TLV-ACGIH
Inorganic Oxide CAS NO.: Proprietary	10 mg/m ³ (Total Dust) 5mg/m ³ (Respirable Dust)	10 mg/m ³ (Total Dust)
Nickel Oxide CAS NO.: 1313-99-1	1 mg/m ³ (as Ni, insoluble compounds)	0.2 mg/m ³ (as Ni, Inhalable fraction)

Unless otherwise noted, all values are reported as 8-hour Time-Weighted Averages (TWAs) and total dust (particulates only).

Respiratory Protection: A NIOSH-certified respirator recommended for dust if media is liberated from purifier body.

Ventilation: General; local exhaust ventilation as necessary to control any air contaminants to within their PELs or TLVs during exposure to media

Protective Equipment: Chemical goggles as needed to prevent irritation. Rubber or neoprene gloves. Body protection as necessary to prevent skin contact.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Black extrusions, gray pellets, and tan beads. Odorless.
Specific Gravity (H₂O=1):	1.0 g/cc (Bulk Density)
Melting Point:	Not Determined
Vapor Pressure (mm Hg):	Not Applicable
Vapor Density (Air=1):	Not Applicable
Evaporation Rate:	Not Applicable
% Solubility in Water:	Insoluble
pH:	Not Determined

SECTION 10 – STABILITY AND REACTIVITY

Stability: Generally considered stable housed inside purifier body or when properly installed in Inert Gas Systems. Purifier may heat up if used with corrosive gases.

Avoid: Heat and humidity.

Incompatibility (Materials to Avoid): Strong acids, strong oxidizing agents and mineral acids. When the Inorganic Oxide is first wetted, the product can heat up to the boiling point of water. Flood with water to cool down.

Hazardous Decomposition or By-Products: Toxic emissions may be released in a fire situation. Mineral acids will react with the nickel content to liberate flammable hydrogen gas. Any material retained (such as hydrocarbons) by this product is reasonably expected to be released during decomposition.

Polymerization: Polymerization is not expected to occur.

SECTION 11- TOXICOLOGICAL INFORMATION

Chemical Name	%Wt.	LD50	LC50
Inorganic Oxide CAS NO.: Proprietary	60-80	5000 mg/kg Rat, Oral	Not Available
Nickel Oxide CAS NO.: 1313-99-1	5-10	50 mg/kg Mouse, subcutaneous	Not Available

*The toxicological data has been taken from products of similar composition.

NOTE: See Section 3, 8 and 12 for additional information.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity: No data available.

Environmental Fate: No data available.

SECTION 13 – DISPOSAL CONSIDERATIONS

Federal, State, and Local disposal laws and regulations will determine the proper waste disposal/recycling/reclamation procedure. All waste materials should be reviewed to determine the applicable hazards (testing may be necessary). Disposal requirements are dependent on the hazard classification and will vary by location and the type of disposal selected.

****NOTE**** Chemical additions, processing or otherwise altering this material may make the waste management information presented above incomplete, inaccurate or otherwise inappropriate.

As local regulations may vary; all waste must be disposed/recycled/reclaimed in accordance with Federal, State, and Local environmental control regulations.

SECTION 14 – TRANSPORT INFORMATION

INTERNATIONAL

UN Number: Not Applicable

UNITED STATES

DOT Classification: Not Applicable

DOT Proper Shipping Name: Not Applicable

Packing Group: Not Applicable

CANADA

PIN Number: Not Applicable

TDG Class: Not Applicable

EC DGL: Not Applicable

SECTION 15 – REGULATORY INFORMATION**US FEDERAL REGULATIONS**

TSCA: Listed

SARA 311 and 312 Hazard Categories

Immediate (Acute) Health Hazard:	Yes
Delayed (Chronic) Health Hazard:	Yes
Fire Hazard:	No
Reactivity Hazard:	No
Sudden Release of Pressure:	No

SARA Section 313 Notification:

This product contains a toxic chemical (or chemicals) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

CHEMICAL NAME	CAS Number	%Wt.
Nickel Oxide	1313-99-1	10-20

OZONE DEPLETING SUBSTANCES (ODS): This product neither contains nor is manufactured with an ozone depleting substance subject to the labeling requirements of the Clean Air Act Amendments 1990 and 40 CFR Part 82.

VOLATILE ORGANIC COMPOUNDS (VOC): None

US STATE REGULATIONS

CALIFORNIA: The State of California has a regulation (Proposition 65) which identifies specific chemicals known to the State of California to cause cancer or birth defects. Proposition 65 requires a disclosure for products sold within the State of California containing an identified chemical. The following information is required by the State of California for this product:

***WARNING:** This product contains chemicals known to the State of California to cause cancer.

Components: Nickel Oxide and Silica, crystalline

CANADIAN REGULATIONS

DSL/NDSL:	DSL
WHMIS Classification:	Class D Division 2 Subdivision A Class D Division 2 Subdivision B

EUROPEAN REGULATIONS

EINECS: Yes

OTHER REGULATIONS

MITI (Japan): Yes

AICS (AUSTRALIA): Yes

SECTION 16 – OTHER INFORMATION

All rights reserved. The above information is believed to be current and accurate; however, Entegris has performed no analysis and makes no warranty with respect to such information and assumes no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.