



Inert and Hydrogen (HX) Gas Purifier Media

MATERIAL SAFETY DATA SHEET

Environmental, Health, & Safety

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Details

Product: Entegris Inert and Hydrogen (HX) Gas Purifier Media
Product Identifier: Entegris (HX) Inert and Hydrogen Gas Purifiers Gas Purification Systems
Chemical Name: Inorganic Oxide and Nickel
Product Use: Hydrogen Gas Purifier removes oxygen, moisture and other molecular impurities from Hydrogen gas and Hydrogen/Inert gas mixtures.

MSDS Number: 8008648
Issue Date: April 5, 2011
Rev. Date:
Revision:

Company Identification

Entegris, Inc.
10070 Willow Creek Road
San Diego, CA 92131
Information: (858) 452-0124

CHEMTREC Emergency Telephone Numbers:

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

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>
Silica, Amorphous	7631-86-9	50-60
Inorganic Oxide	Trade Secret	20-50
Nickel	7440-02-0	10-30
Nickel Oxide	1313-99-1	10-30
Magnesium Oxide	1309-48-4	5-10
Quartz	14808-60-7	0.1-1.0

Note: See Section 9 for Exposure Limits and Section 11 for Toxicological Information.

SECTION 3 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Black extrusions and tan pellets
Odor: Odorless
Specific Gravity (H₂O=1): 0.9 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 4 – HAZARDS IDENTIFICATION

****Note**** In the unlikely event that the purifier media is liberated from the purifier housing (whether intentional or accidental), health hazards may arise from the inhalation, ingestion, and/or contact with the skin or eyes.

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.

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.

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

Carcinogenicity: Nickel

NTP: YES IARC: YES OSHA: NO ACGIH: NO

Nickel has been classified by the International Agency for Research on Cancer (IARC) as Probable Carcinogenic to Humans, by the National Toxicology Program (NTP) as having sufficient evidence of carcinogenicity in experimental animals, and by the American Conference of Governmental Industrial Hygienists (ACGIH) as Not Suspected as a Human Carcinogen).

Carcinogenicity: Inorganic Oxide

NTP: YES IARC: YES OSHA: NO ACGIH: YES

An Inorganic Oxide has been classified by the International Agency for Research on Cancer (IARC) as Carcinogenic to Humans, by the National Toxicology Program (NTP) as Possible Carcinogenic to humans, and by the American Conference of Governmental Industrial Hygienists (ACGIH) as Carcinogenic to Humans.

Carcinogenicity: Quartz

NTP: YES IARC: YES OSHA: YES ACGIH: YES

Quartz has been classified by the International Agency for Research on Cancer (IARC) as Carcinogenic to Humans, by the National Toxicology Program (NTP) as Known to be a Human carcinogen, by US OSGA as Known Carcinogen, and by the American Conference of Governmental Industrial Hygienists (ACGIH) as Suspected Human Carcinogen.

Chronic Health Hazards: Prolonged or repeated exposure to dust may cause pulmonary problems, including cancer. 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.

SECTION 5 – FIRST AID MEASURES

****Note**** In the unlikely event that the purifier media is liberated from the purifier housing (whether intentional or accidental), 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.

SECTION 6 – FIRE-FIGHTING MEASURES

Flash Point:	Not Determined
Auto-Ignition:	Not Applicable (see Note)
LEL:	Not Applicable
UEL:	Not Applicable

****Note**** The media within the housing will remain stable when exposed to external ambient air temperatures below 79°C (175°F). At external ambient temperatures above 79°C (175°F) oxidation will occur. When media within housing is exposed to air and moisture, the oxidation process may generate temperatures high enough to cause combustion. Exposure to atmospheres containing hydrogen and temperatures above 150°C (300°F) will render media pyrophoric. Exposure of the pyrophoric product to air at room temperature will cause ignition.

Extinguishing Media: Use water mist, carbon dioxide, dry chemical 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

SECTION 7 – ACCIDENTAL RELEASE MEASURES

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 depending on volume of release. 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 in accordance with 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 9: Exposure Control/Personal Protection), and disposal of the material should be in accordance with Section 13: Disposal Considerations.

SECTION 8 - 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 9 – EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits Ingredients:	PEL-OSHA	TLV-ACGIH
Inorganic Oxide CAS NO.: Proprietary	10 mg/m ³ (Total Dust) 5 mg/m ³ (Respirable Dust)	10mg/m ³ (Total Dust)
Nickel CAS NO.: 7440-02-0	1 mg/m ³	1. 5 mg/m ³ (Inhalable Fraction)
Nickel Oxide CAS NO.: 1313-99-1	1 mg/m ³ (as Ni, insoluble compounds)	0.2 mg/m ³ (as Ni, Inhalable fraction)
Magnesium Oxide CAS NO.: 1309-48-4	15 mg/m ³ (Total Particulate)	10 mg/m ³ (Inhalable Fraction)
Silica, Amorphous CAS NO.: 7631-48-4	80 mg/m ³ + %SiO ₂	10 mg/m ³ (Inhalable Fraction) 3 mg/m ³ (Respirable Fraction)
Quartz CAS NO.: 14808-60-7	Total Dust: 30/(%SiO ₂ +2) Resp. Dust: 10/(%SiO ₂ +2)	0.025 mg/m ³ (Resp. Fraction)

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

Malaysia Permissible Exposure Limits:

Exposure Limits Ingredients:	8-Hour TWA Airborne Concentration mg/m3
Inorganic Oxide CAS NO.: Proprietary	10mg/m ³
Nickel CAS NO.: 7440-02-0	1.5 mg/m ³ 0.2 mg/m ³ (Inhalable Fraction) 0.1 mg/m ³ (Soluble compounds, as Ni)
Nickel Oxide CAS NO.: 1313-99-1	10 mg/m ³ (Inhalable particulate)
Magnesium Oxide CAS NO.: 1309-48-4	10 mg/m ³ (Fume)
Silica, Amorphous CAS NO.: 7631-48-4	0.05 mg/m ³ (Crystalline Respirable Fraction)
Quartz CAS NO.: 14808-60-7	0.1 mg/m ³ (Crystalline Respirable Fraction)

Respiratory Protection: A NIOSH-certified respirator is 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 10 – STABILITY AND REACTIVITY

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

Avoid: Heat and humidity.

Incompatibility (Materials to Avoid): Air, oxygen, strong acids, strong oxidizing agents and mineral acids.

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. Thermal decomposition may produce oxides of Inorganic Oxide.

Polymerization: Polymerization is not expected to occur.

SECTION 11- TOXICOLOGICAL INFORMATION

Chemical Name	%Wt.	Acute Toxicity (Other)	Acute Toxicity (Oral)
Silica, Amorphous CAS NO.: 7631-48-4	50-60	Not Available	3,160 mg/kg (rat)
Inorganic Oxide CAS NO.: Proprietary	20-50	Not Available	5000mg/kg (rat)
Nickel CAS NO.: 7440-02-0	10-30	Not Available	Not Available
Nickel Oxide CAS NO.: 1313-99-1	10-30	50mg/kg Mouse, subcutaneous	Not Available
Magnesium Oxide CAS NO.: 1309-48-4	5-10	Not Available	Not Available
Quartz CAS NO.: 14808-60-7	0.1-1.0	Not Available	Not Available

NOTE: See Section 4, 9 and 12 for additional information.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity: No data available.

Environmental Fate: No data available.

SECTION 13 – DISPOSAL CONSIDERATIONS

Country, 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 (IATA)**

UN Number:	UN3190
Class/Division:	4.2
Proper Shipping Name:	Self Heating Solid, Inorganic, N.O.S. (Nickel mixture)
Packing Group	II

Malaysia

UN Number:	UN3190
DOT Classification:	4.2 Spontaneously combustible material
Proper Shipping Name:	Self Heating Solid, Inorganic, N.O.S. (Nickel mixture)
Packing Group:	II

UNITED STATES (DOT)

Identification Number:	UN3190
DOT Classification:	4.2 Spontaneously combustible material
DOT Proper Shipping Name:	Self Heating Solid, Inorganic, N.O.S. (Nickel mixture)
Packing Group:	II

CANADA

PIN Number:	UN3190
TDG Class:	4.2 Spontaneously combustible material
EC DGL:	Spontaneously combustible substance

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

TSCA: All ingredients of this mixture are listed on or compliant with the TSCA inventory.

SARA 311 and 312 Hazard Categories

Immediate (Acute) Health Hazard:	Yes
Delayed (Chronic) Health Hazard:	Yes
Fire Hazard:	Yes
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	7440-02-0	10-30
Nickel Oxide	1313-99-1	10-30
Magnesium Oxide	1309-48-4	5-10

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, Nickel Oxide and Quartz

CANADIAN REGULATIONS

DSL/NDSL: DSL
WHMIS Classification: Class B Division 6
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

The chemical, physical and toxicological properties of this material have not been thoroughly investigated. Exercise due care.

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