




## MATERION

### 1. Chemical and company identification

Name of chemical (Product name)	ITO Targets	
Supplier's company name, address and phone number		
Company name	Materion Advanced Materials	
Address	6070 Parkland Boulevard Mayfield Heights, OH 44124 United States	
Contact person	Theodore Knudson	
Telephone	EH&S	1.216.383.4019
e-mail address	ehs@materion.com	
Emergency telephone number	See Section 16.	
Reference number	G42	

### 2. Hazards identification

GHS classification		
Physical hazards	The product is not classified according to GHS.	
Health hazards	Specific target organ toxicity, repeated exposure	Category 1 (digestive organs, frame, lung)
Environmental hazards	The product is not classified according to GHS.	
GHS label elements		
Pictograms		
Signal words	None. Danger	
Hazard statement	Causes damage to organs (digestive organs, frame, lung) through prolonged or repeated exposure. The material as sold in solid form is generally not considered hazardous. However, if the process involves grinding, melting, cutting or any other process that causes a release of dust or fumes, hazardous levels of airborne particulate could be generated.	
Precautionary statement		
Prevention	Observe good industrial hygiene practices.	
Response	Get medical advice/attention if you feel unwell. Wash hands after handling.	
Storage	Store away from incompatible materials.	
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.	
Other hazards which do not result in classification	None known.	
Supplemental information	For further information, please contact the Product Stewardship Department at +1.216.383.4019.	
Main symptoms and emergency overview		
Main symptoms	Coughing. Discomfort in the chest. Shortness of breath. Prolonged exposure may cause chronic effects.	
Emergency overview	Causes damage to organs through prolonged or repeated exposure. The products are classified as articles and, as such, do not present a physical or health hazard in the present form. If the products are processed or handled in ways that generate particles (dust, fume, particles or powder) and/or chemical compounds, a potential health hazard could exist and risk management measures must be taken to minimize risk.	

### 3. Composition/information on ingredients

Substance or mixture	Mixture
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Chemical name or generic name	CAS Number	Gazette notification		Concentration (%)
		ENCS no.	ISHL no.	
Indium oxide Synonym(s): Indium oxide (In <sub>2</sub> O <sub>3</sub> ) INDIUM OXIDE Diindium trioxide INDIUM (III) OXIDE	1312-43-2	(1)-750	(1)-750	99
Tin oxide Synonym(s): Tin oxide (SnO <sub>2</sub> ) Tin dioxide Stannic oxide	18282-10-5	(1)-551	(1)-551	1 - 20

**Chemical formula** In<sub>2</sub>O<sub>3</sub> (1312-43-2), O<sub>2</sub>-Sn (18282-10-5)

#### 4. First aid measures

<b>If inhaled</b>	Move to fresh air. Call a physician if symptoms develop or persist.
<b>If on skin</b>	Wash off with soap and water. Get medical attention if irritation develops and persists.
<b>If in eyes</b>	Get medical attention if irritation develops and persists.
<b>If swallowed</b>	Rinse mouth. Get medical attention if symptoms occur.
<b>Most important symptoms/effects, acute and delayed</b>	Coughing. Discomfort in the chest. Shortness of breath. Prolonged exposure may cause chronic effects. None known.
<b>Protection of first-aid responders</b>	If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.
<b>Notes to physician</b>	Treat symptomatically.

#### 5. Fire-fighting measures

<b>Extinguishing media</b>	Extinguish with alcohol-resistant foam, carbon dioxide or dry powder.
<b>Extinguishing media to avoid</b>	None known.
<b>Specific hazards</b>	This product is not flammable.
<b>Special fire fighting procedures</b>	Use standard firefighting procedures and consider the hazards of other involved materials. Use water spray to cool unopened containers.
<b>Protection of fire-fighters</b>	Use protective equipment appropriate for surrounding materials.
<b>General fire hazards</b>	No unusual fire or explosion hazards noted. None known.
<b>Specific methods</b>	Use standard firefighting procedures and consider the hazards of other involved materials.

#### 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Keep unnecessary personnel away. Ensure suitable personal protection (including respiratory protection) during removal of spillages in a confined area.
<b>Environmental precautions</b>	Avoid discharge into drains, water courses or onto the ground. Collect spillage.
<b>Methods and materials for containment and cleaning up</b>	Stop the flow of material, if this is without risk. For waste disposal, see section 13 of the SDS.
<b>Prevention of secondary hazards</b>	None known.

#### 7. Handling and storage

<b>Handling</b>	
<b>Technical measures (e.g. Local and general ventilation)</b>	Provide adequate ventilation.
<b>Safe handling advice</b>	Avoid prolonged exposure. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Observe good industrial hygiene practices. Use personal protection recommended in Section 8 of the SDS.
<b>Contact avoidance measures</b>	Chlorine. For further information, please refer to section 10 of the SDS.

**Hygiene measures** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

#### Storage

**Safe storage conditions** Store away from incompatible materials (see Section 10 of the SDS).

**Safe packaging materials** Store in original tightly closed container.

### 8. Exposure controls/personal protection

**Control parameters** Follow standard monitoring procedures.

#### Occupational exposure limits

##### US. ACGIH Threshold Limit Values

Components	Type	Value
Indium oxide (CAS 1312-43-2)	TWA	0.1 mg/m <sup>3</sup>
Tin oxide (CAS 18282-10-5)	TWA	2 mg/m <sup>3</sup>

#### Biological limit values

##### Japan. BELs - JSOH (Japan Society of Occupational Health: Recommendation of Occupational Exposure Limits Based on Biological Monitoring)

Components	Value	Determinant	Specimen	Sampling Time
Indium oxide (CAS 1312-43-2)	3 µg/l	Indium	Serum	*

\* - For sampling details, please see the source document.

**Engineering measures** Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

#### Personal protective equipment

**Respiratory protection** In case of insufficient ventilation, wear suitable respiratory equipment.

**Hand protection** Wear protective gloves.

**Eye protection** If contact is likely, safety glasses with side shields are recommended.

**Skin and body protection** Wear suitable protective clothing. Use of an impervious apron is recommended.

### 9. Physical and chemical properties

<b>Physical state</b>	Solid.
<b>Form</b>	Solid.
<b>Color</b>	Black.
<b>Odor</b>	None.
<b>Odor threshold</b>	Not applicable.
<b>Melting point/freezing point</b>	2966 °F (1630 °C) estimated / Not applicable.
<b>Boiling point, initial boiling point, and boiling range</b>	Not applicable.
<b>Combustibility</b>	None known.
<b>Lower and upper explosion limit / flammability limit</b>	
Explosive limit - lower (%)	Not applicable.
Explosive limit - lower (%) temperature	Not applicable.
Explosive limit - upper (%)	Not applicable.
Explosive limit - upper (%) temperature	Not applicable.
<b>Flash point</b>	Not applicable.
<b>Auto-ignition temperature</b>	Not applicable.
<b>Decomposition temperature</b>	Not applicable.
<b>pH</b>	Not applicable.

Kinematic viscosity	Not available.
<b>Solubility(ies)</b>	
Solubility (water)	Insoluble.
Partition coefficient (n-octanol/water) (log value)	Not applicable. Not applicable.
Vapor pressure	Not applicable.
<b>Density and/or relative density</b>	
Density	6.95 g/cm <sup>3</sup> estimated
Relative density	Not applicable.
Vapor density	Not applicable.
Particle characteristics	Not available.
<b>Other information</b>	
Evaporation rate	Not applicable.
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Viscosity (Coefficient of viscosity)	Not applicable.

## 10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Chlorine. None known.
Hazardous decomposition products	No hazardous decomposition products are known.

## 11. Toxicological information

Acute toxicity	Not known.
Skin corrosion/irritation	Not likely, due to the form of the product.
Serious eye damage/eye irritation	None known.
<b>Respiratory or skin sensitization</b>	
Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	Not a skin sensitizer.
Germ cell mutagenicity	Not classified.
Carcinogenicity	Not classified.
Reproductive toxicity	Not classified.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Causes damage to organs (digestive organs, frame, lung) through prolonged or repeated exposure.
Aspiration hazard	Not an aspiration hazard.

## 12. Ecological information

Ecotoxicity	Not relevant, due to the form of the product.
Persistence and degradability	No data is available on the degradability of any ingredients in the mixture.
Bioaccumulation	No data available.
Mobility in soil	The product is insoluble in water.
Hazardous to the ozone layer	No data available.
Other hazardous effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

### 13. Disposal considerations

<b>Residual waste</b>	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
<b>Contaminated packaging</b>	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.
<b>Local disposal regulations</b>	Contract with a disposal operator licensed by the Law on Disposal and Cleaning. Dispose of contents/container in accordance with local/regional/national/international regulations. When your own wastewater treatment plant is not available, collect entire waste and then charge to a licensed industrial waste management professional with manifests for industrial waste.

### 14. Transport information

#### IATA

Not regulated as dangerous goods.

#### IMDG

Not regulated as dangerous goods.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not applicable.

**National regulations** Follow regulation in section 15 for domestic transportation.

### 15. Regulatory information

#### Industrial Safety and Health Act

##### Specified substances regulation

###### Class 2 designated chemical substances

INDIUM OXIDE

##### Notifiable substances

INDIUM COMPOUNDS

Table 9 Ordinance No. 58 80 - 99 %

TIN AND TIN COMPOUNDS

Table 9 Ordinance No. 322 1.0 - 20 %

##### Labeling substances

INDIUM COMPOUND

80 - 99 %

#### Poisonous and Deleterious Substances Control Act

##### Specified poisonous substances

Not regulated.

##### Poisonous substances

Not regulated.

##### Deleterious substances

Not regulated.

#### Act on the Regulation of Manufacture and Evaluation of Chemical Substances

##### Class I specified chemical substances

Not regulated.

##### Class II specified chemical substances

Not regulated.

##### Monitoring chemical substances

Not regulated.

##### Priority Assessment Chemical Substances (PACs)

Not regulated.

##### Reporting Exempted Substances

Not regulated.

#### Law concerning Pollutant Release and Transfer Register

##### Specified class 1 substances (substance name, ordinance number and content)

Not regulated.

##### Class 1 substances (substance name, ordinance number and content)

INDIUM AND ITS COMPOUNDS Ordinance No. 44 99 % (Indium oxide)

##### Class 2 substances (substance name, ordinance number and content)

Not regulated.

**Ship Safety Law, Dangerous Goods Marine Transport and Storage Rule**

Not regulated.

**Air Law, Enforcement Rule**

Not regulated.

**Explosives Control Act**

Not regulated.

## 16. Other information

### Bibliography

ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices  
HSDB® - Hazardous Substances Data Bank  
IARC Monographs. Overall Evaluation of Carcinogenicity  
National Toxicology Program (NTP) Report on Carcinogens  
Japan Society for Occupational Health, Recommendation of Occupational Exposure Limits  
Japan Chemical Industry Association (JCIA) GHS Guideline, June 2012  
JIS Z 7252:2014 Classification of chemicals based on "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)"  
JIS Z 7253:2012 Hazard communication of chemicals based on GHS - Labelling and Safety Data Sheet (SDS)

### Further information

Transportation Emergency  
Call Chemtrec at:  
International: 703.741.5970  
Spain: 900.868.538  
Switzerland: 0800.564.402  
Chemtrec's toll free, mobile-enabled number in Germany – 0800 1817059

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### Other information

Revised information in Section 16.