Material Safety Data Sheet

Ostalloy 117

Section 1. Chemical product and company identification

Common name : **Ostalloy 117**
Material uses : Other non specified industry: Gravity Die Casting.
IPDS Code : 25489060
Validation date : **11 / 12 / 2004**
In case of emergency : CHEMTREC : (800) 424 - 9300

Emergency telephone number IPDS Umicore : 011 32 2 2277026

Supplier : Umicore Indium Products

50 Sims Avenue
Providence, RI 02909
USA
Phone : +1 4012151704

Section 2. Composition, Information on Ingredients

Name	CAS #	% by weight	Exposure limits
Lead	7439-92-1	22.6	**ACGIH TLV (United States, 2003).** TWA: 0,05 mg/m³ 8 hour(s). **NIOSH REL (United States, 2001).** TWA: 0,05 mg/m³ 10 hour(s). **OSHA PEL (United States, 1993).** TWA: 50 µg/m³ 8 hour(s).
indium	7440-74-6	19.1	**ACGIH TLV (United States, 2003).** TWA: 0,1 mg/m³ 8 hour(s). **NIOSH REL (United States, 2001).** TWA: 0,1 mg/m³ 10 hour(s). **OSHA PEL 1989 (United States, 1989).** TWA: 0,1 mg/m³ 8 hour(s).
Tin	7440-31-5	8.3	**ACGIH TLV (United States, 2003).** TWA: 2 mg/m³ 8 hour(s). **NIOSH REL (United States, 2001).** TWA: 2 mg/m³ 10 hour(s).
cadmium	7440-43-9	5.3	**ACGIH TLV (United States, 2/2003).** TWA: 0,002 mg/m³ 8 hour(s). Form: All forms **OSHA PEL (United States, 6/1993).** TWA: 5 µg/m³ 8 hour(s). Form: All forms **OSHA PEL 1989 (United States, 3/1989).** CEIL: 0,6 mg/m³ Form: Dust CEIL: 0,3 mg/m³ Form: Fume TWA: 0,2 mg/m³ 8 hour(s). Form: Dust TWA: 0,1 mg/m³ 8 hour(s). Form: Fume TWA: 5 µg/m³ 8 hour(s). Form: All forms **OSHA PEL Z2 (United States, 5/2002).** CEIL: 0,6 mg/m³ Form: Dust CEIL: 0,3 mg/m³ Form: Fume

TWA: 0,2 mg/m^3 8 hour(s). Form: Dust
TWA: 0,1 mg/m^3 8 hour(s). Form: Fume

Section 3. Hazards identification

Physical State and Appearance : Solid. (Metal solid.)

Emergency overview : Warning!

CANCER HAZARD
CONTAINS MATERIAL WHICH CAN CAUSE CANCER
HARMFUL IF INHALED.
CAUSES EYE IRRITATION.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, KIDNEYS, LUNGS, LIVER, HEART, GASTROINTESTINAL TRACT, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA, PROSTATE.
MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED.
Do not ingest. Avoid prolonged contact with eyes, skin, and clothing. Avoid breathing dust. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Risk of cancer depends on duration and level of exposure.

Routes of entry : Not available.

Potential acute health effects

Eyes : Irritating to eyes.

Skin : Harmful in contact with skin.

Inhalation : Toxic by inhalation.

Ingestion : No known significant effects or critical hazards.

Potential chronic health effects : **CARCINOGENIC EFFECTS** : Classified A3 (Proven for animal.) by ACGIH [Lead]. Classified 1 (Proven for human.) by IARC, 1 (Known To Be Human Carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH [cadmium]. Classified A2 (Suspected for human.) by ACGIH [cadmium].
MUTAGENIC EFFECTS Not available.
TERATOGENIC EFFECTS Not available.

Medical conditions aggravated by overexposure: : Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Over-exposure signs/symptoms : Not available.

See toxicological Information (section 11)

Section 4. First aid measures

Eye Contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

Skin Contact : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Inhalation : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately.

Notes to Physician : Not available.

Section 5. Fire fighting measures

Flammability of the product	:	Non-flammable.
Auto-ignition Temperature	:	Not applicable.
Flash Points	:	Not applicable.
Flammable limits	:	Not applicable.
Products of combustion	:	Not applicable.
Fire hazards in presence of various substances	:	Not applicable.
Explosion hazards in presence of various substances	:	Not considered as a product presenting risks of explosion.
Fire fighting media and instructions	:	Use an extinguishing agent suitable for surrounding fires. No specific hazard. See section 11 for more detailed information on health effects and symptoms.
Special protective equipment for fire-fighters	:	Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.
Special remarks on fire hazards	:	Not available.
Special remarks on explosion hazards	:	Not available.

Section 6. Accidental release measures

Personal precautions	:	Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8).
Environmental precautions and clean-up methods	:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. If emergency personnel are unavailable vacuum or carefully scoop up spilled materials and place in an appropriate container for disposal. Avoid creating dusty conditions and prevent wind dispersal.

Section 7. Handling and storage

Handling	:	Avoid exposure. Use suitable protective equipment (Section 8). Avoid generation of dust.
Storage	:	This material is delivered without packaging as solid material. No packaging requirements applicable.

Section 8. Exposure Controls, Personal Protection

Engineering controls : Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
Recommended:EU : safety glasses with side shields (EN 166) . USA : Wear ANSI compliant safety glasses with side shields Canada : Wear CSA approved safety glasses with side shields. Mono goggles provide better protection in dusty conditions.

Skin protection / Hand protection : Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Body: Recommended:Gloves: Protective gloves should be worn under normal conditions of use. When handling hot material, wear heat resistant protective gloves, clothing and face shield that are able to withstand the temperature of the molten product.

Respiratory : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary.Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Personal protective equipment (Pictograms) :

Personal protection in case of a large spill : Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Product Name	Exposure limits
Lead	**ACGIH TLV (United States, 2003). Notes: Substance identified by other sources as a suspected or confirmed human carcinogen. 1995-1996 Adoption. Substances for which the TLV is higher than the OSHA Permissible Exposure Limit (PEL) and/or the NIOSH Recommended Exposure Limit (REL). See CFR 58(1** TWA: 0,05 mg/m^3 8 hour(s). **NIOSH REL (United States, 2001). Notes: See Appendix C - Supplemental Exposure Limits Note: The REL and PEL also apply to other lead compounds (as Pb).** TWA: 0,05 mg/m^3 10 hour(s). **OSHA PEL (United States, 1993).** TWA: 50 µg/m^3 8 hour(s).
indium	**ACGIH TLV (United States, 2003).** TWA: 0,1 mg/m^3 8 hour(s). **NIOSH REL (United States, 2001). Notes: Note: The REL also applies to other Indium compounds (as In).** TWA: 0,1 mg/m^3 10 hour(s). **OSHA PEL 1989 (United States, 1989).** TWA: 0,1 mg/m^3 8 hour(s).
Tin	**ACGIH TLV (United States, 2003). Notes:** TWA: 2 mg/m^3 8 hour(s). **NIOSH REL (United States, 2001). Notes: Note: The REL and PEL**

also apply to other inorganic tin compounds (as Sn) except tin oxides.
TWA: 2 mg/m³ 10 hour(s).

cadmium

ACGIH TLV (United States, 2/2003). Notes: Substance identified by other sources as a suspected or confirmed human carcinogen. Respirable fraction. The concentration of respirable dust for the application of this limit is to be determined for the fraction passing a size-selector with the characteristics defined in the "C." paragraph of Appendix D. Substances for which the TLV is higher than the OSHA Permissible Exposure Limit (PEL) and/or the NIOSH Recommended Exposure Limit (REL). See CFR 58(124) :36338-33351, June 30, 1993, for revised OSHA PEL. Identifies substances identified in the BEI documetations for Methemoglobin inducers (for which methemoglobin is the principle toxicity) and organophosphorous cholinesterase inhibitors are part of this notation. Refers to Appendix A -- Carcinogens.
TWA: 0,002 mg/m³ 8 hour(s). Form: All forms
OSHA PEL (United States, 6/1993).
TWA: 5 µg/m³ 8 hour(s). Form: All forms
OSHA PEL 1989 (United States, 3/1989). Notes: See Table Z-2. Sec.1910.1027 Cadmium.
CEIL: 0,6 mg/m³ Form: Dust
CEIL: 0,3 mg/m³ Form: Fume
TWA: 0,2 mg/m³ 8 hour(s). Form: Dust
TWA: 0,1 mg/m³ 8 hour(s). Form: Fume
TWA: 5 µg/m³ 8 hour(s). Form: All forms
OSHA PEL Z2 (United States, 5/2002).
CEIL: 0,6 mg/m³ Form: Dust
CEIL: 0,3 mg/m³ Form: Fume
TWA: 0,2 mg/m³ 8 hour(s). Form: Dust
TWA: 0,1 mg/m³ 8 hour(s). Form: Fume

Consult local authorities for acceptable exposure limits.

Hygiene measures

General information :

Section 9. Physical and chemical properties

Physical State and Appearance : Solid. (Metal solid.)

Color : Silvery.

Odor : Odorless.

Taste : Tasteless.

Molecular Weight : Not applicable.

Molecular formula : Not applicable.

pH : Not applicable.

Boiling/condensation point : Not available.

Melting/freezing point : 47.2°C (117°F)

Critical temperature : Not available.

Specific Gravity : Weighted average: 9.16 (Water = 1)

Vapor pressure : Not available.

Vapor density : Not available.

Volatility	:	Not available.
Odor threshold	:	Not available.
Evaporation rate	:	Not available.
VOC	:	Not available.
Viscosity	:	Not available.
LogK_{ow}	:	Not available.
Ionicity (in water)	:	Not available.
Dispersion properties	:	Is not dispersed in cold water, hot water.
Solubility	:	Insoluble in cold water, hot water.
Physical chemical comments	:	Not available.

Section 10. Stability and reactivity

Stability and Reactivity	:	The product is stable.
Conditions of instability	:	Not available.
Incompatibility with various substances	:	Highly reactive with acids. Slightly reactive to reactive with oxidizing agents.
Hazardous Decomposition Products	:	Not available.
Hazardous polymerization	:	Not available.

Section 11. Toxicological information

Toxicity data

Ingredient name	Test	Result	Route	Species
Lead	LDLo	160 mg/kg	Oral	pigeon
cadmium	LD50	2330 mg/kg	Oral	Rat
	LD50	890 mg/kg	Oral	Mouse
	LDLo	70 mg/kg	Oral	Rabbit
	LC50	25 mg/m^3 (1 hour(s))	Inhalation	Rat

Chronic effects on humans : **CARCINOGENIC EFFECTS** : Classified A3 (Proven for animal.) by ACGIH [Lead]. Classified 1 (Proven for human.) by IARC, 1 (Known To Be Human Carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH [cadmium]. Classified A2 (Suspected for human.) by ACGIH [cadmium].
Contains material which causes damage to the following organs: blood, kidneys, lungs, liver, heart, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea, prostate.

Remarks : **Lead**: Repeated or prolonged exposure to the substance can produce kidney damage. Repeated or prolonged exposure to the substance can produce nervous system damage.

Special remarks on chronic effects on humans : **cadmium**: Repeated or prolonged exposure to the substance can produce kidney damage.

Special remarks on other toxic effects on humans : **cadmium:** Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing.
Lead: May cause headache, nausea or weakness in case of long term exposure. Repeated or prolonged exposure to the substance can produce liver damage.

Specific effects

Carcinogenic effects : Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Target organs : Contains material which causes damage to the following organs: blood, kidneys, lungs, liver, heart, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea, prostate.

Section 12. Ecological information

Ecotoxicity data

Ingredient name	Species	Period	Result
Lead	Oncorhynchus mykiss (LC50)	96 hour(s)	1.17 mg/l
	Oncorhynchus mykiss (LC50)	96 hour(s)	471 mg/l
	Oncorhynchus mykiss (LC50)	96 hour(s)	542 mg/l
cadmium	Selenastrum capricornutum (EC50)	48 hour(s)	0.109 mg/l
	Selenastrum capricornutum (EC50)	48 hour(s)	0.111 mg/l
	Selenastrum capricornutum (EC50)	48 hour(s)	0.126 mg/l
	Pimephales promelas (LC50)	96 hour(s)	0.001 mg/l
	Pimephales promelas (LC50)	96 hour(s)	0.0011 mg/l
	Cyprinus carpio (LC50)	96 hour(s)	0.002 mg/l

BOD and COD : Not available.

Biodegradable/Ol : Not available.

Mobility : Not available.

Products of degradation : Some metallic oxides.

Special remarks on the products of biodegradation : Not available.

Section 13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Waste stream : Not available.

Consult your local or regional authorities.

Section 14. Transport information

Regulatory Information	UN number	Proper shipping name	Class	Packin group	Label	Additional information
DOT Classification	Not available.	Not available.	Not available.	Not availab		Not available.
TDG Classification	Not available.	Not available.	Not available.	Not availab		Not available.
ADR/RID Class	Not available.	Not available.	Not available.	Not availab		Not available.
IMDG Class	Not available.	Not available.	Not available.	Not availab		Not available.
IATA-DGR Class	Not available.	Not available.	Not available.	Not availab		Not available.

Section 15. Regulatory information

HCS Classification : Toxic Material
Irritating material
Carcinogen
Target organ effects

Contains material which causes damage to the following organs: blood, kidneys, lungs, liver, heart, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea, prostate.

U.S. Federal regulations : TSCA 6 proposed risk management: Lead
TSCA 8(a) PAIR: indium
TSCA 8(b) inventory: Tin; indium; Bismuth; cadmium; Lead

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Tin; indium; Bismuth; cadmium; Lead
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Tin: Immediate (Acute) Health Hazard; indium: Delayed (Chronic) Health Hazard; Bismuth: Fire hazard; cadmium: Fire hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; Lead: Delayed (Chronic) Health Hazard

Clean Water Act (CWA) 307: cadmium; Lead

Clean Water Act (CWA) 311: No products were found.

Clean air act (CAA) 112 accidental release prevention: No products were found.

Clean air act (CAA) 112 regulated flammable substances: No products were found.

Clean air act (CAA) 112 regulated toxic substances: No products were found.

SARA 313

Form R - Reporting requirements :	Lead	22.6
	cadmium	5.3
Supplier notification :	Lead	22.6
	cadmium	5.3

State regulations : Pennsylvania RTK: Tin: (generic environmental hazard); indium: (generic environmental hazard); cadmium: (environmental hazard, generic environmental hazard); Lead: (environmental hazard, generic environmental hazard)
Massachusetts RTK: Tin; indium; cadmium; Lead
New Jersey: Tin; indium; cadmium; Lead

WARNING: This product contains chemical(s) known to the state of California to cause cancer, birth defects or other reproductive harm: cadmium; Lead
WARNING: This product contains chemical(s) known to the state of California to cause reproductive harm (female): Lead
WARNING: This product contains chemical(s) known to the state of California to cause reproductive harm (male): cadmium; Lead
California prop. 65 (no significant risk level): cadmium: 0.05 µg/day (inhalation); Lead: 15 µg/day (ingestion)
California prop. 65 (acceptable daily intake level): cadmium
WARNING: This product contains chemical(s) known to the state of California to cause birth defects or other reproductive harm.: cadmium; Lead
WARNING: This product contains chemical(s) known to the state of California to cause cancer.: cadmium; Lead

International regulations

DSCL (EEC) : This product is not classified according to the EU regulations.

International lists : Australia (NICNAS): Tin; indium; Bismuth; cadmium; Lead

China: Tin; indium; Bismuth; cadmium; Lead

Korea (TCCL): Tin; indium; Bismuth; cadmium; Lead

Philippines (RA6969): Tin; indium; Bismuth; cadmium; Lead

CEPA DSL: Tin; indium; Bismuth; cadmium; Lead

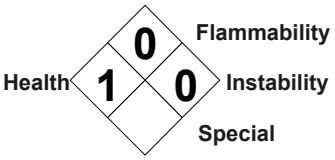
WHMIS (Canada) : Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
Class D-2A: Material causing other toxic effects (VERY TOXIC).

Section 16. Other information

Hazardous Material Information System (U.S.A.) :

Health	*	2
Fire hazard		0
Reactivity		0
Personal protection		C

National Fire Protection Association (U.S.A.)



References Not available.

Other special considerations Not available.

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Notice to reader

To the best of our knowledge, the information contained in this Material Safety Data Sheet is accurate and reliable on presently available resources. However, neither the seller nor any of its subsidiaries assumes any responsibility or liability whatsoever for the accuracy or completeness of the information contained herein.
This Material Safety Data Sheet shall not constitute a guarantee for any specific product features. Final determination of suitability of this material is the sole responsibility of the user.
All materials may present unknown hazards and should be used and handled with caution and following reasonable safety procedures. Consequently the buyer assumes all risks in connection with the use and handling of this material.