SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Trade name	Tin Antimony Alloy
Product code	None
Product list	Alloy : 95Sn-5Sb, BM-91, BM-92, BM-94, #95, #97 ; Jewellery-Pewter Alloy ; Spetial Alloy.
Supplier	Xstrata Zinc, General Smelting Company of Canada, 1400 Norman Street, Lachine (Québec), Canada H8S 1A8
Information contact	Gino De Nobile, Chemist
Phon number (Business hours)	(514) 637-3591
Phone number (Emergency)	CANUTEC : (613) 996-6666
Synonym	Alliage étain antimoine (French)
Name / Chemical formula	Not applicable
Chemical family	Metal
Utilisation	Anti-friction bearings, specific plumbing applications ; Jewelry, ornaments, pewter.

SECTION 2. HAZARDS IDENTIFICATION

WHMIS (Canada) CLASS D-2A : Very toxic material causing other toxic effects

Hazard classes (categories)/Hazard statements None

Hazards words None

Precautionary statements None

Other hazards Reactive with : Acids, oxidants. Release of hydrides, hydrogen. Possibility of eye and skin irritation (Particules). Ingestion will nearly always cause acute gastro-intestinal irritation.

Environmental hazards Toxic for aquatic life.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Name	CAS No	Percentage (%)	EC No	Hazard statements
Tin	7440-31-5	70-100	231-141-8	none
Antimony	7440-36-0	1-10	231-146-5	None
Copper	7440-50-8	0-5	231-159-6	None
Lead	7439-92-1	0-1	231-100-4	None

SECTION 4. FIRST-AID MEASURES

Eye contact Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Consult a physician.

Skin contact Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention.

Inhalation Remove the person from exposure. Bring to fresh air. If breathing is difficult, give oxygen. Get immediate medical attention.

Ingestion Induce vomiting. **UNCONSCIOUS** person : **DO NOT** induce vomiting or give any liquid. Consult a physician.

SECTION 5. FIRE-FIGHTING MEASURES

Flash point Not available

Flammable limits Not available

Autoignition temperature Not available

Products of combustion Metal oxides

Fire hazard Solid form : No fire hazard. Avoid melting moist metal. Dust : Flammable when exposed to heat or flames. Heated and on contact with acids or acid fumes, metals can release hydrogen and form **stibine**, (**Extremely** toxic gas).
Tin : Fine dust combustible when exposed to heat.
Antimony : Spontaneously flammable in fluorine, chlorine, or bromine. With iodine : Reaction produces heat, which may cause flames or explosion if quantities are great enough. Dust or vapours exposed to heat or flame : Moderate fire or explosion hazard.
Lead : In contact with fire or heat source, it may melt, and then if in contact with water, will cause a violent reaction. Possibility of toxic lead vapours formation.

Explosion hazard Not explosive (Mechanical impact ; Static discharge). **NEVER** spray water on burning metal because of the risk of explosion which would splatter flaming particles of metal to great distances.
Dust : Slightly explosive to explosive in presence of open flames and sparks.

Extinguishing media NON-FLAMMABLE. Use fire fighting materials and procedures adapted to the immediate environment.

Protective equipment Firefighters must wear full protective clothing and self-contained breathing apparatus (SCBA).

SECTION 6. ACCIDENTAL RELEASE MEASURES

Measures Collect spillage.

Methods Use appropriate tools to place spilled materials in suitable containers for reclamation or disposal.

Protective equipment High concentrations of fumes or dust or risk of emission of toxic material (**Stibine**) : Use a positive-pressure, self-contained breathing apparatus (SCBA) to avoid inhalation of material. Low concentrations : Use a NIOSH/OSHA approved full face cartridge respirator or the equivalent. Full protective clothing. Work gloves and boots.

SECTION 7. HANDLING AND STORAGE

Handling **DO NOT** ingest or inhale dust. Wear adequate protective clothing. Wear approved respirators if adequate ventilation cannot be provided. Ingestion or inhalation : Seek medical advice immediately and provide medical personnel with a copy of this SDS.
Heated and on contact with acids or acid fumes, metals (Aluminum, zinc, iron, etc.) can release hydrogen : Nascent hydrogen may form : Antimony hydride (**Stibine**) (**Extremely** toxic gas). If hydrides suspected in the area, the workplace must be **immediately** evacuated. Personnel entering this area **MUST** wear positive-pressure, self contained breathing apparatus (SCBA).

Conditions for storage Container tightly close. Cool and Well ventilated area. Away from : Moisture, incompatible substances (Acids).

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

			Control parameters		
			ACGIH (U.S.) 2011	OSHA (U.S.)	QUEBEC (CA)
Name	CAS No	Percentage (%)	TLV-TWA (mg/m^3)	PEL-TWA (mg/m^3)	TWAEV (mg/m^3)
Tin	7440-31-5	70-100	2 (Sn)	2 (metal, compounds)	2 (metal)
Antimony	7440-36-0	1-10	0.5 (Sb, compds Sb)	0.5 (Sb, compds Sb)	0.5 (Sb, compds Sb)
Copper	7440-50-8	0-5	1 (dust, mist, Cu) 0.2 (fumes)	1 (dust, mist, Cu) 0.1 (fumes)	1 (dust, mist, Cu) 0.2 (fumes Cu)
Lead	7439-92-1	0-1	0.05 (Pb, inorganic compds Pb)	0.05 (Pb, Pb compds)	0.05 (Pb, inorganic compds)

Note : **Tin :** ACGIH TLV TWA : Metal, oxide, inorganic compounds (Sn) except SnH_4. OSHA PEL-TWA : Metal, inorganic compounds (Sn) except oxides. NIOSH REL-TWA (≤10 hours) : 2 mg/m^3 (Except oxides) ; IDLH : 100 mg/m^3.

Antimony : ACGIH TLV-TWA : Elemental and compounds. NIOSH REL-TWA (≤10-hours) : 0.5 mg/m^3 ; IDLH : 50 mg/m^3.

Copper : NIOSH REL-TWA (≤10 hours) : 1 mg/m^3 (Copper, copper compounds, as Cu, except fumes) ; IDLH : 100 mg/m^3 (Metal ; Dust, mists, fumes, compounds Cu).

Lead : ACGIH TLV TWA : 0.05 mg/m^3 (Lead and inorganic compounds). NIOSH REL-TWA (≤10 hours) : 0.05 mg/m^3 ; REL also applies to other lead compounds (as Pb) ; IDLH : 100 mg/m^3 (Metal ; Compounds). OSHA PEL-TWA : PEL also applies to other lead compounds (as Pb).

Consult local authorities for acceptable exposure limits

Engineering controls Use process enclosures, local exhaust ventilation or other engineering controls to keep airborne levels below recommended exposure limits.

Individual protection Safety goggles. Coveralls. Work gloves and boots. Dust respirator. Be sure to use a NIOSH approved respirator or equivalent when concentrations exceed occupational exposure limits.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance	Solid (Ingot, bar, wire)	**Odour**	Odourless
Molecular weight	Not applicable	**Taste**	Not applicable
pH (1% soln/water)	Not applicable	**Colour**	Silver to grey yellow
Boiling point	Not available	**Volatility**	Not available
Melting point	The lowest : ~240°C (464°F)	**% Moisture**	Not available
Critical temperature	Not available	**Odour threshold**	Not available
Specific gravity	The lowest : 6.69 (Water = 1)	**Water/Oil dist. coeff.**	Not available
Vapour pressure	Not available	**Ionicity (in water)**	Not available
Vapour density	Not available	**Dispersion**	No (Water)
Solubility	No (Water)		

SECTION 10. STABILITY AND REACTIVITY

Stability Yes (Under normal conditions of ambiant temperature)

Reactivity Reactive or incompatible with : Acids.

Dangerous decomposition Metallic oxides
Heated and on contact with acids or acid fumes, metals (Soft or galvanized metal, aluminum) can release hydrogen and form antimony hydride (**Stibine**) (**Extremely** toxic gas).

Conditions to avoid Acids

Dangerous polymerization No

Materials to avoid

Tin : Reacts violently under certain conditions with : Chlorine, bromine, trifluoride (Chlorine, bromine), acids, oxidants. Can react with some extinguishing agents (Bicarbonate powder, carbon dioxide).

Antimony : Possibility of violent reaction with : Ammonium nitrate, bromate trifluoride, halogens, chloric acid, chlorine trifluoride, nitric acid, potassium nitrate, potassium permanganate, dipotassium peroxide, sodium nitrate and oxidants.

Copper : Violent reaction with : Bromates, chlorates, hydrogen peroxide, sulfuric acid, sodium peroxide, dipotassium peroxide, hydrazoic acid, combination of hydrogen sulfur and air.

Lead : Violent reaction on ignition with : Chlorine trifluoride, concentrated hydrogen peroxide, ammonium nitrate, sodium acetylide. Other incompatibilities : Sodium nitrate, zirconium, disodium acetylide, oxidants.

NOTE : This list of products is not exhaustive. Verify technical documents to determine any incompatibilities with your process.

Corrosivity

No

SECTION 11. TOXICOLOGICAL INFORMATION

Routes of entry

Ingestion. Inhalation. Eyes and skin contact.

Carcinogenicity

Lead : POSSIBLE (Group 2B, IARC) (EPA) ; CARCINOGEN (Animal, A3, ACGIH).
Copper ; Tin : NOT A CARCINOGEN (IARC, OSHA, NTP) ; NOT LISTED (ACGIH).
Antimony : NOT LISTED (IARC, ACGIH).

Mutagenicity

Lead : Cytogenetic analysis ; DNA. (RTECS).

Teratogenicity

Lead : SUSPECTED (OSHA). Effects on embryo, foetus, fertility (RTECS).

Acute toxicity

Tin : UNREPORTED ROUTE acute (LoTD) : 250 mg/kg (Human). (RTECS).
Antimony : ORAL acute (LD50) : 7 000 mg/kg (Rat). INTRAPERITONEAL acute (LD50) : 100 mg/kg (Rat) ; 80 mg/kg (Mouse). (RTECS).
Copper : SUBCUTENOUS acute (LoLD) : 375 mg/kg (Rabbit) ; INTRAPERITONAL acute (LD 50) : 0.7 mg/kg (Mouse). (RTECS).
Lead : ORAL acute (LoLD) : 155 mg/kg (Human) ; 0.2 mg/kg (Rat). INHALATION acute (LoTC) : 10 µg/m^3 (Human). INTRAPERITONEAL acute (LoLD) : 1 g/kg (Rat). (RTECS).

Acute effects

Solid form : No health hazards. Conditions and work practices which generate dust or fumes should be avoided or controlled. Other forms : Dangerous (Ingestion, inhalation).
Copper : Exposure to fumes or extremely fine dust (Concentrations of 0.075 to 0.12 mg/m³) may cause **metal fume fever**, a delayed, generally benign, transient, reversible flu-like condition.
Lead : Absorption is easier by inhalation and the symptoms develop more quickly than by ingestion. Symptoms : Loss of appetite, anemia, insomnia, headache, muscle and joint pain. Toxicity by ingestion, compared to those by inhalation, requires greater concentrations before symptom onset.

Chronic effects

Non-controlled repeated or prolonged exposure : Possibility of target organ damages (Blood, kidneys, liver, lungs ; nervous and reproductive systems).
Tin : Low toxicity for humans. Chronic inhalation of oxide (Dust, fume) may cause stannosis (Benign pneumoconiosis) without any pulmonary functional impairment. Other sensitive organs : Kidneys, central nervous system.

Antimony : The principal toxicological properties mimic those of arsenic such as : Abdominal cramps, nausea, vomiting, watery diarrhea which may be bloody. Possibility of dermatitis called **antimony spots** : Papules and pustules around sweat and sebaceous glands (Generally on the forearms) which resemble chicken pox and are transient in nature. Some people may develop an allergy to antimony metal. Inhalation (Antimony and compounds) : Possibility of pneumoconiosis which can lead to some obstructive lung disease. There is some evidence that antimony may have some effect on the heart.

Copper : Target organs for acute and chronic overexposure (NIOSH 90-117) : Respiratory system, skin, liver and kidneys.

Lead : Target organs for acute and chronic overexposure (NIOSH 90-117) : Blood, gingival tissues ; gastro-intestinal, central nervous, renal systems. Symptoms of acute overexposure often develop abruptly and resemble those of chronic overexposure : Anaemia, lassitude, weakness, nausea, vomiting, abdominal cramps, constipation, confusion, convulsions, muscular weakness, muscular and joint pains. Target organs (Chronic overexposure) : Blood, kidneys, digestive, nervous and reproductive systems.

Toxicity

Persons with the following pre-existing conditions warrant particular attention :
Tin : Respiratory system (Inorganic compounds).
Antimony : Pulmonary and cardiac conditions.
Copper : Wilson's disease.
Lead : Anaemia, pregnant or breast feeding women and women of child bearing age. Preferred method for biological monitoring : Blood lead levels (Pb blood) measurement (BEI 30 µg/100 ml) ; Sampling time : Not critical.
Eating, drinking and smoking must be prohibited in areas where this material is handled and processed. Wash hands and face before eating, drinking and smoking.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity
Heavy metals : Harmful to aquatic life.

Toxicity to animals
Tin : UNREPORTED ROUTE acute (LoTD) : 250 mg/kg (Human). (RTECS).
Copper : SUBCUTENOUS acute (LoLD) : 375 mg/kg (Rabbit) ; INTRAPERITONAL acute (LD 50) : 0.7 mg/kg (Mouse). (RTECS).
Lead : ORAL acute (LoLD) : 155 mg/kg (Human) ; 0.2 mg/kg (Rat). INHALATION acute (LoTC) : 10 µg/m^3 (Human). INTRAPERITONEAL acute (LoLD) : 1 g/kg (Rat). (RTECS).

Mobility (Soil)
Not applicable

Persistence and degradability
Not applicable

Bioaccumulation
Not applicable

Biodegradation products
Not biodegradable

Biodegradation products (Toxicity)
Not applicable

Remarks on Environment
Due to the product's composition, particular attention must be taken : Substances potentially toxic to aquatic life include copper, lead.
Run-off water may become acidic and may be harmful to flora and fauna.

BOD5 and COD
Not available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
Recycle to process, if possible. P501-Dispose of contents/container in full compliance with Federal, Provincial and local regulations.

SECTION 14. TRANSPORT INFORMATION

TDG (Pictograms)
Not regulated (Canada)

PIN
Not applicable

Special provisions (Transport)
Not applicable

SECTION 15. REGULATORY INFORMATION

Labelling (GHS)
Regulation (EC) No 1272/2008 CLP : Not listed.

Labeling (DSD)
EU (Regulation 67/548/EEC) : Not listed.
EU: Consolidated Inventories : Listed
Tin : EU Consolidated Inventories : EC Number 231-141-8
Antimony : EU Consolidated Inventories : EC Number 231-146-5
Copper : EU Consolidated Inventories : EC Number 231-159-6
Lead : EU Consolidated Inventories : EC Number 231-100-4
Not classified in the Annex I of Directive 67/548/EEC
Not listed in the Annex I of Council Regulation No (EC) 304/2003
Not listed in a priority list (as foreseen under Council Regulation (EEC) No 793/93

Risk phrases (DSD)
None

Safety phrases (DSD)
None

CEPA DSL (CANADA)
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) : on the Domestic Substances List (DSL) ; acceptable for use under the provisions of CEPA.

Regulation (U.S.A.)
CERCLA Section 103 Hazardous substances (40 CFR 302.4) ; SARA 110 ATSDR CERCLA Priority List : Listed ; SARA Section 313, Toxic Chemicals (40 CFR 372.65) : Listed.
Antimony (RQ) **:** *5 000 pounds (2 270 kg)
Copper (RQ) **:** *5 000 pounds (2 270 kg)
Lead (RQ) **:** *10 pounds (4.54 kg)

TSCA (EPA, Toxic Substance Control Act) Chemical Inventory (40 CFR710) : Listed.
Tin ; Antimony ; Copper ; Lead.

* No declaration required if the diameter of the piece of solid metal released is equal to or exceeds 100 micrometers (0.004 inches).

Classifications HCS (U.S.A.)
Toxic

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

Fire Hazard 0	Reactivity 0	Health 2	Special Hazard

SECTION 16. OTHER INFORMATION

References

- TLVs and BEIs (2011). Based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices. ACGIH, Cincinnati, OH – http://www.acgih.org
- CCOHS (2011) - Canadian Centre for Occupational Health and Safety - http://www.ccohs.ca/
- CSST (2011) - Commission de la Santé et de la Sécurité du Travail (Québec). Service du répertoire toxicologique http://www.reptox.csst.qc.ca/

- ESIS : C&L (Classification and Labelling), substances ou préparations selon la Directive 67/548/EEC (substances) et 1999/45/EC (préparations).
- ESIS : EINECS (European Inventory of Existing Commercial chemical Substances) O.J. C 146A, 15.6.1990
- ESIS : EINECS corrections publiées dans O.J. C 54/13 01.03.2002, 2002/C54/08.
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- Guidance on the Application of the CLP Criteria. Guidance to Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging (CLP) of substances and mixtures. 25/08/2009. ECHA Reference : ECHA-09-G-02-EN. © European Chemicals Agency, 2009.
- ERG (2008). Emergency Response Guidebook, U.S. Department of Transportation, Transport Canada, et le Secretariat of Communications and Transportation of Mexico
- Guidance on the Application of the CLP Criteria. Guidance to Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging (CLP) of substances and mixtures. 25/08/2009. ECHA Reference : ECHA-09-G-02-EN. © European Chemicals Agency, 2009.
- HSDB (2011) - Hazardous Substances Data Bank. TOXNET® Network of databases on toxicology, hazardous chemicals, and environmental health. NLM Databases & Electronic Resources, U.S. National Library of Medicine, NHI, 8600 Rockville Pike, Bethesda, MD 20894 http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB
- IARC - Monographs on the Evaluation of Carcinogenic Risks to Humans (collection) - http://www-cie.iarc.fr/
- Merck Index (1999). Merck & CO., Inc, 12th edition
- NIOSH U.S. (2011) - Pocket Guide to Chemical Hazards - http://www.cdc.gov/niosh/npg/
- Patty's Industrial Hygiene and Toxicology, 3rd Revised Edition
- Règlement sur les produits contrôlés (Canada)
- REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing. Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. (Text with EEA relevance). Official Journal of the European Union. L353 p1-1355, 1.12.2008.
- RTECS (2011). Registry of Toxic Effects of Chemical Substances, NIOSH, CDC
- Toxicologie industrielle & intoxication professionnelle, 3e édition, Lauwerys
- TSCA (2011) - U.S. EPA Toxic Substance Control Act, Chemical Inventory. System of Registries (SoR), Substance Registry Services, http://iaspub.epa.gov/sor_internet/registry/substreg/searchandretrieve/substancesearch/search.do

Glossary

CSST : Commission de la Santé et de la Sécurité du Travail (Québec).
HSDB : Hazardous Substances Data Bank.
IARC : International Agency for Research on Cancer.
NIOSH : National Institute of Occupational Safety and Health.
NTP : U.S. National Toxicology Program.
RTECS : Registry of Toxic Effects of Chemical Substances
STOT : Specific target organ toxicity

Note No specific studies have been performed on this mixture. For your protection, we suggest that you test it before using in your process.

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Notice to reader