Safety Data Sheet

5N PLUS

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

Product Name • **Bismuth, lead, tin, cadmium, Alloy (10-30% cadmium)**

Synonyms • Bi/Pb/Sn/Cd Alloy; MCP 70; MCP 73; MCP 75; Metspec 158; Metspec 158/165

Product Code • 1224

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified use(s) • Industrial uses : Use of substance as such in preparations at industrial sites; Manufacture of basic metals, including alloys; Base metals and alloys; Service life (professional worker): use of metal containing articles.

Use(s) advised against • No specific uses advised against are identified

1.3 Details of the supplier of the safety data sheet

Manufacturer • 5N Plus UK Ltd.

1-4 Nielson Road Finedon Road Industrial Estate
Wellingborough Northamptonshire NN8 4PE
United Kingdom
www.5nplus.com
msds@5nplus.com

Telephone (General) • +44(0)1933 225766

1.4 Emergency telephone number

• For Chemical Emergency Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300 CCN14093 Outside USA and Canada: +1 703-527-3887 (collect calls accepted)

Section 2: Hazards Identification

EU/EEC

According to: Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]
According to: EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

CLP • Reproductive Toxicity 2 - H361f
Reproductive Toxicity 2 - H361d
Acute Toxicity Inhalation 2 - H330
Carcinogenicity 1B - H350

Germ Cell Mutagenicity 2 - H341
Hazardous to the aquatic environment Acute 1 - H400
Hazardous to the aquatic environment Chronic 1 - H410
Reproductive Toxicity 2 - H361fd
Specific Target Organ Toxicity Repeated Exposure 1 - H372

DSD/DPD

- Carcinogenic Substances - Category 2
Dangerous to the Environment (N)
Mutagenic Substances - Category 3
Substances Toxic To Reproduction - Category 2
Very Toxic (T+)
Toxic (T)

R45, R63, R62, R68, R48/23/25, R26, R50/53

2.2 Label Elements

CLP

DANGER

Hazard statements

- H372 - Causes damage to organs through prolonged or repeated exposure.
H330 - Fatal if inhaled
H350 - May cause cancer.
H341 - Suspected of causing genetic defects.
H361fd - Suspected of damaging fertility. Suspected of damaging the unborn child.
H410 - Very toxic to aquatic life with long lasting effects

Precautionary statements

Prevention

- P273 - Avoid release to the environment.
P260 - Do not breathe dust, fume, gas, mist, vapours and/or spray.
P270 - Do not eat, drink or smoke when using this product.
P202 - Do not handle until all safety precautions have been read and understood.
P285 - In case of inadequate ventilation wear respiratory protection.
P264 - Wash thoroughly after handling.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.

Response

- P391 - Collect spillage.
P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Storage/Disposal

- P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.

- Metals in massive form, alloys do not require a label according to Annex 1 of Regulation (EC) No 1272/2008, if they do not present a hazard to human health by inhalation, ingestion or contact with skin or to the aquatic environment in the form in which they are placed on the market, although classified as hazardous in accordance with the criteria of Annex 1.
Ensure that a risk assessment is carried out for your own use if metal/alloy is processed or worked.

DSD/DPD

Risk phrases

- R45 - May cause cancer.
R63 - Possible risk of harm to the unborn child.
R62 - Possible risk of impaired fertility.
R68 - Possible risk of irreversible effects.
R48/23/25 - Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R26 - Very toxic by inhalation.
R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the

aquatic environment.

Safety phrases
- S28 - After contact with skin, wash immediately with plenty of …
  S53 - Avoid exposure - obtain special instructions before use.
  S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
  S57 - Use appropriate containment to avoid environmental contamination.
  S37 - Wear suitable gloves.
  S36 - Wear suitable protective clothing.

2.3 Other Hazards

CLP
- The PBT and vPvB criteria of Annex XIII to the regulation (EC) 1907/2006 does not apply to inorganic substances.

DSD/DPD
- None

United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

OSHA HCS 2012
- Acute Toxicity Inhalation 2
  Carcinogenicity 1B
  Germ Cell Mutagenicity 2
  Reproductive Toxicity 2
  Specific Target Organ Toxicity Repeated Exposure 1

2.2 Label elements

OSHA HCS 2012

DANGER

Hazard statements
- Causes damage to organs through prolonged or repeated exposure.
  Fatal if inhaled
  May cause cancer.
  Suspected of causing genetic defects.
  Suspected of damaging fertility or the unborn child.
  Very toxic to aquatic life with long lasting effects

Precautionary statements

Prevention
- Avoid release to the environment.
  Do not breathe dust, fume, gas, mist, vapours and/or spray.
  Do not eat, drink or smoke when using this product.
  Do not handle until all safety precautions have been read and understood.
  In case of inadequate ventilation wear respiratory protection.
  Wash thoroughly after handling.
  Wear protective gloves/protective clothing/eye protection/face protection.

Response
- Collect spillage.
  IF exposed or concerned: Get medical advice/attention.
  IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Storage/Disposal
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.
  Store in a well-ventilated place. Keep container tightly closed.
  Store locked up.

2.3 Other hazards

OSHA HCS 2012
- None

Canada

According to: WHMIS

2.1 Classification of the substance or mixture

WHMIS

- Other Toxic Effects - D2A
  Very Toxic - D1A

2.2 Label elements

WHMIS

- Other Toxic Effects - D2A
  Very Toxic - D1A

2.3 Other hazards

WHMIS

- None

Section 3 - Composition/Information on Ingredients

3.1 Substances

- Material does not meet the criteria of a substance.

3.2 Mixtures

Composition				
Chemical Name	**Identifiers**	**%**	**Classifications According to Regulation/Directive**	**Comments**
Bismuth	**CAS:**7440-69-9 **EC Number:**231-177-4 **REACH:**01-2119560575-33	30% TO 60%	**WHMIS:** Not classified **EU DSD/DPD:** Not classified **EU CLP:** Not classified **OSHA HCS 2012:** Not classified	-
Tin	**CAS:**7440-31-5 **EC Number:**231-141-8 **REACH:**01-2119486474-28	10% TO 30%	**WHMIS:** Not classified **EU DSD/DPD:** Not classified **EU CLP:** Not classified **OSHA HCS 2012:** Not classified	-
Lead	**CAS:**7439-92-1 **EC Number:**231-100-4 **REACH:**01-2119513221-59	10% TO 30%	**WHMIS:** Not classified **EU DSD/DPD:** Not classified **EU CLP:** Not classified **OSHA HCS 2012:** Not classified	Classification based on massive form
Cadmium	**CAS:**7440-43-9 **EC Number:**231-152-8 **REACH:**01-	10% TO 30%	**WHMIS:** Very Toxic - D1A; Other Toxic Effects - D2A **EU DSD/DPD:** EU CLP, Annex VI, Table 3.2: Carc.Cat.2, R45; Muta.Cat.3, R68; Repr.Cat.3, R62, R63; T+, R26; T, R48/23/25; N, R50, R53 **EU CLP:** Acute Tox. 2, H330; STOT RE 1, H372; Muta. 2, H341; Carc. 1B, H350; Repr. 2, H361fd;	Is included in the Candidate List of Substances of Very High Concern (SVHC) for Authorisation, which is published in accordance with Article 59 (10) of the REACH Regulation.

	2119489023-40		Aquatic Acute 1, H400; Aquatic Chronic 1, H410 **OSHA HCS 2012:** Acute Tox. Inhal. 2; STOT RE 1; Muta. 2; Carc. 1B; Repr. 2	

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

Skin
- If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Ingestion
- Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs. Get medical attention if symptoms occur.

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician
- No recommendation given, but first aid may still be required in case of accidental exposure, inhalation or ingestion of this chemical. If in doubt, GET MEDICAL ATTENTION PROMPTLY!

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media
- This product is not flammable. Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable Extinguishing Media
- DO NOT use water if avoidable.

Firefighting Procedures
- Confining and smothering metal fires is preferable rather than applying water. Corrosive substances in contact with metals may produce flammable hydrogen gas.

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards
- Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Hazardous Combustion Products
- Fire or high temperature may create : Toxic gases/vapours/fumes of metal oxides or oxides.

5.3 Advice for firefighters

- Do not allow to enter drains, sewers or watercourses.
  Dike and collect extinguishing water.
  Fire fighters should wear complete protective clothing including self-contained breathing apparatus.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions
- Warn everybody of potential hazards and evacuate if necessary. Avoid breathing vapors, dust, or spray mist. Avoid contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

Emergency Procedures
- Avoid generation and spreading dust. Do not allow to enter drains, sewers or

watercourses.

6.2 Environmental precautions

- Avoid discharge into drains, water courses or onto the ground. Dike and collect extinguishing water. Avoid generation and spreading dust.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures

- Allow product to cool/solidify and pick up as a solid.
Avoid generating dust.
Collect powder using special dust vacuum cleaner with particle filter or carefully sweep into closed container. Ensure that waste and contaminated materials are collected and removed from the work area as soon as possible in a suitably labelled container.
For waste disposal, see section 13.

6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling

- Avoid handling which leads to dust formation. Avoid inhalation of dust and contact with skin and eyes. Avoid excessive heat for prolonged period of time. Do not handle broken packages without protective equipment. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Change work clothing daily before leaving the work place. Wash contaminated clothing before reuse. Pregnant women should not work with this product, if there is the least risk of exposure.

7.2 Conditions for safe storage, including any incompatibilities

Storage

- Store in a cool, dry, well-ventilated place.

7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits/Guidelines						
	Result	**ACGIH**	**Belgium**	**Canada Ontario**	**Canada Quebec**	**China**
Tin (7440-31-5)	TWAs	2 mg/m3 TWA	2 mg/m3 TWA	2 mg/m3 TWA	2 mg/m3 TWAEV	Not established
Cadmium (7440-43-9)	STELs	Not established	Not established	Not established	Not established	0.02 mg/m3 STEL
	TWAs	0.01 mg/m3 TWA; 0.002 mg/m3 TWA (respirable fraction)	0.002 mg/m3 TWA (alveolar particulates); 0.01 mg/m3 TWA (inhalable particulate)	0.01 mg/m3 TWA; 0.002 mg/m3 TWA (respirable)	0.025 mg/m3 TWAEV	0.01 mg/m3 TWA
Lead	STELs	Not established	Not established	Not established	Not established	0.15 mg/m3 STEL (dust); 0.09 mg/m3 STEL (fume)
				0.05 mg/m3 TWA (designated substances		

(7439-92-1)	TWAs	0.05 mg/m3 TWA	Not established	regulation); 0.05 mg/m3 TWA (applies to workplaces to which the designated substances regulation does not apply)	0.05 mg/m3 TWAEV	0.05 mg/m3 TWA (dust); 0.03 mg/m3 TWA (fume)

Exposure Limits/Guidelines (Con't.)

	Result	China Highly Toxic Goods	France	Malaysia	NIOSH	OSHA
Tin (7440-31-5)	TWAs	Not established	Not established	2 mg/m3 TWA	2 mg/m3 TWA	Not established
Cadmium (7440-43-9)	TWAs	0.01 mg/m3 TWA	0.05 mg/m3 TWA [VME]	0.01 mg/m3 TWA; 0.002 mg/m3 TWA (respirable fraction)	Not established	0.1 mg/m3 TWA (fume, applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect); 0.2 mg/m3 TWA (dust, applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect); 5 µg/m3 TWA
	Ceilings	Not established	Not established	Not established	Not established	0.3 mg/m3 Ceiling (applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect, fume); 0.6 mg/m3 Ceiling (applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect, dust)
	STELs	0.02 mg/m3 STEL	Not established	Not established	Not established	Not established
Lead (7439-92-1)	TWAs	Not established	0.1 mg/m3 TWA [VME] (restrictive limit)	0.05 mg/m3 TWA	0.050 mg/m3 TWA	50 µg/m3 TWA
	Ceilings	0.05 mg/m3 Ceiling (dust); 0.03 mg/m3 Ceiling (fume)	Not established	Not established	Not established	Not established

Exposure Limits/Guidelines (Con't.)

	Result	United Kingdom
Cadmium (7440-43-9)	STELs	0.075 mg/m3 STEL (calculated)
	TWAs	0.025 mg/m3 TWA
Lead (7439-92-1)	STELs	0.45 mg/m3 STEL (calculated, as Pb)

	TWAs	0.15 mg/m3 TWA

Exposure Control Notations

United Kingdom

•Cadmium (7440-43-9): **Carcinogens:** (Capable of causing cancer and/or heritable genetic damage)

Belgium

•Tin (7440-31-5): **Skin:** (Skin)

•Cadmium (7440-43-9): **Carcinogens:** (Carcinogen)

Canada Ontario

•Lead (7439-92-1): **Designated Substances:** (0.05 mg/m3 TWA)

Canada Quebec

•Lead (7439-92-1): **Carcinogens:** (C3 carcinogen - effect detected in animals)

•Cadmium (7440-43-9): **Carcinogens:** (C2 carcinogen - effect suspected in humans)

France

•Lead (7439-92-1): **Carcinogens:** (Carcinogen categories 1,2,3) | **Reproductive Toxins:** (Reproductive Toxin categories 1,2,3)

•Cadmium (7440-43-9): **Carcinogens:** (Carcinogen categories 1,2,3) | **Mutagens:** (Mutagen categories 1,2,3) | **Reproductive Toxins:** (Reproductive Toxin categories 1,2,3)

ACGIH

•Lead (7439-92-1): **Carcinogens:** (A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans)

•Cadmium (7440-43-9): **Carcinogens:** (A2 - Suspected Human Carcinogen)

Germany TRGS

•Lead (7439-92-1): **Developmental Toxins:** (Category 1 (bioavailable, metal)) | **Reproductive Toxins:** (Category 3 (bioavailable, metal))

•Cadmium (7440-43-9): **Carcinogens:** (Category 2 (bioavailable, as inhalable dust/aerosol))

Germany DFG

•Lead (7439-92-1): **Carcinogens:** (Category 2 (considered to be carcinogenic for man))

•Cadmium (7440-43-9): **Carcinogens:** (Category 1 (causes cancer in man)) | **Skin:** (skin notation)

Exposure Limits Supplemental

ACGIH

•Tin (7440-31-5): **TLV Basis - Critical Effects:** (pneumoconiosis (or stannosis))

•Lead (7439-92-1): **BEIs:** (30 µg/100 ml Medium: blood Time: not critical Parameter: Lead (Note: Women of child bearing potential, whose blood Pb exceeds 10 µg/dL, are at risk of delivering a child with a blood Pb over the current Centers for Disease Control guideline of 10 µg/dL. If the blood Pb of such children remains elevated, they may be at increased risk of cognitive deficits. The blood Pb of these children should be closely monitored and appropriate steps should be taken to minimize the child's exposure to environmental lead.)) | **TLV Basis - Critical Effects:** (CNS and PNS impairment; hematologic effects)

•Cadmium (7440-43-9): **BEIs:** (5 µg/g creatinine Medium: urine Time: not critical Parameter: Cadmium (background); 5 µg/L Medium: blood Time: not critical Parameter: Cadmium (background)) | **TLV Basis - Critical Effects:** (kidney damage)

Germany TRGS

•Lead (7439-92-1): **BELs:** (300 µg/L Medium: whole blood Time: no restriction Parameter: Lead (women age below 45 years); 400 µg/L Medium: whole blood Time: no restriction Parameter: Lead (women 45 years and older))

8.2 Exposure controls

Engineering Measures/Controls

- Adequate ventilation systems as needed to control concentrations of airborne contaminants below applicable threshold limit values. Ensure that dust handling systems (such as exhaust ducts, dust collectors, vessels and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is not leakage from the equipment).

Personal Protective Equipment

Pictograms

- 

Respiratory

- In case of insufficient ventilation, wear suitable respiratory equipment.

Eye/Face

- 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. If operating conditions cause high dust concentrations to be produced, use dust goggles. Recommended ; safety glasses with side-shields.

Hands	• Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Skin/Body	• Wear suitable protective clothing as protection against splashing or contamination.
Thermal hazards	• The molten product can causes serious burns.
General Industrial Hygiene Considerations	• Handle in accordance with good industrial hygiene and safety practice. When using do not smoke or eat. Wash hands before eating, drinking, or smoking. Change work clothing daily before leaving work place. Wash contaminated clothing before reuse.
Environmental Exposure Controls	• Avoid release to the environment. Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Solid	Appearance/Description	Metallic solid.
Color	Grey	Odor	Odorless
Physical and Chemical Properties	This safety data sheet covers several alloys of similar composition and hazard profile. Physical properties can vary. Refer to technical data sheet for alloy specific physical properties.	Organic/Inorganic	Inorganic
General Properties			
Melting Point/Freezing Point	No data available	Specific Gravity/Relative Density	No data available
Water Solubility	Insoluble	Explosive Properties	Classification criteria not met.
Oxidizing Properties:	Classification criteria not met.		
Flammability			
Flammability (solid, gas)	Classification criteria not met.		

9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions

- Not relevant.

10.4 Conditions to avoid

- Excess heat.

10.5 Incompatible materials

- strong acids. strong oxidising substances.

10.6 Hazardous decomposition products

- When heated, vapours/gases hazardous to health may be formed.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Components		
Bismuth (30% TO 60%)	7440-69-9	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • >2000 mg/kg
Tin (10% TO 30%)	7440-31-5	**Acute Toxicity:** Ingestion/Oral-Rat, adult female LD50 • >2000 mg/kg 15 Day(s); Inhalation-Rat LC50 • >4.75 mg/L 4 Hour(s); Skin-Rat LD50 • >2000 mg/kg 24 Hour(s)
Lead (10% TO 30%)	7439-92-1	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • >2000 mg/kg 98 Hour(s)
Cadmium (10% TO 30%)	7440-43-9	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 225 mg/kg; Inhalation-Rat LC50 • 25 mg/L 4 Hour(s)

GHS Properties	Classification
Acute toxicity	**EU/CLP** • Acute Toxicity - Dermal - Classification criteria not met; Acute Toxicity - Inhalation 2; Acute Toxicity - Oral - Classification criteria not met **OSHA HCS 2012** • Acute Toxicity - Dermal - Classification criteria not met; Acute Toxicity - Inhalation 2; Acute Toxicity - Oral - Classification criteria not met
Aspiration Hazard	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Carcinogenicity	**EU/CLP** • Carcinogenicity 1B **OSHA HCS 2012** • Carcinogenicity 1B
Germ Cell Mutagenicity	**EU/CLP** • Germ Cell Mutagenicity 2 **OSHA HCS 2012** • Germ Cell Mutagenicity 2
Skin corrosion/Irritation	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Skin sensitization	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
STOT-RE	**EU/CLP** • Specific Target Organ Toxicity Repeated Exposure 1 **OSHA HCS 2012** • Specific Target Organ Toxicity Repeated Exposure 1
STOT-SE	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Toxicity for Reproduction	**EU/CLP** • Toxic to Reproduction 2 **OSHA HCS 2012** • Toxic to Reproduction 2
Respiratory sensitization	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Serious eye damage/Irritation	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking

Potential Health Effects

Inhalation

Acute (Immediate)
- Exposure to dust may cause irritation. May cause coughing and difficulties in breathing. Vapours may cause headache, fatigue, dizziness and nausea.

Chronic (Delayed)
- Repeated and prolonged exposure may affect the lungs and respiratory system.

Skin

Acute (Immediate)
- No specific symptoms noted. The molten product can cause serious burns. Exposure to dust may cause mechanical irritation.

Chronic (Delayed)
- Under normal conditions of use, no health effects are expected. Repeated and prolonged exposure may cause redness and irritation.

Eye

Acute (Immediate)
- No specific symptoms noted. Excessive concentrations of nuisance dust in the workplace may reduce visibility and may cause unpleasant deposits in eyes. Adverse symptoms may include the following : irritation, watering, redness.

Chronic (Delayed)
- Under normal conditions of use, no health effects are expected. Repeated or prolonged exposure to corrosive materials or fumes may cause conjunctivitis.

Ingestion

Acute (Immediate)
- Metallic taste. May cause stomach pain or vomiting.

Chronic (Delayed)
- Under normal conditions of use, no health effects are expected. Repeated or prolonged exposure to corrosive materials or fumes may cause gastrointestinal distrubances.

Mutagenic Effects
- Repeated and prolonged exposure may cause mutagenic effects.

Carcinogenic Effects
- Contains Cadmium which known as a carcinogen for humans.

Carcinogenic Effects				
	CAS	OSHA	IARC	NTP
Cadmium	7440-43-9	Specifically Regulated Carcinogen	Group 1-Carcinogenic	Known Human Carcinogen
Lead	7439-92-1	Not Listed	Group 2A-Probable Carcinogen	Reasonably Anticipated to be Human Carcinogen

Reproductive Effects
- Repeated and prolonged exposure may cause reproductive effects.

Section 12 - Ecological Information

12.1 Toxicity

Component	CAS	Data	Comments
Bismuth (30% TO 60%)	7440-69-9	**Aquatic Plant(s):** 72 Hour(s) EC50 Algae 100 mg/L ; **Crustacea:** 48 Hour(s) EC50 Water Flea 100 mg/L ; **Fish:** 96 Hour(s) LC50 Fish 100 mg/L ; **Other:** 3 Hour(s) NOEC Other 300 mg/L	
Tin (10% TO 30%)	7440-31-5	**Aquatic Plant(s):** 72 Hour(s) EC50 Algae 19.2 µg/L [static]; **Fish:** 96 Hour(s) LC50 Fish 12.4 µg/L [static]; **Other:** 3 Hour(s) EC50 Other 511 mg/L [static]	
Lead (10% TO 30%)	7439-92-1	**Aquatic Plant(s):** 48 Hour(s) EC50 Aquatic Plant(s) 35.9 µg/L [static; pH 6.6]; **Crustacea:** 96 Hour(s) LC50 Crustacea 596.83 µg/L [static]; **Fish:** 96 Hour(s) LC50 Fish 1170 µg/L [static, freshwater, Hardness 20mg/l pH 6.85]	
Cadmium (10% TO 30%)	7440-43-9	**Aquatic Plant(s):** 72 Hour(s) EC50 Aquatic Plant(s) 70 µg/L [static]; **Fish:** 96 Hour(s) LC50 Fish 15.5 mg/L ; **Other:** 3 Hour(s) NOEC Other 200 µg/L [static]	

- The product contains a substance which is toxic to aquatic organisms and which may cause long term adverse effects in the aquatic environment. Not regarded as a health or environmental hazard in the supplied form. Please ensure that a risk assessment is carried out for your own use if processed or worked.

12.2 Persistence and degradability

- The product solely consist of inorganic compounds which are not biodegradable.

12.3 Bioaccumulative potential

- Bioaccumulation is unlikely to be significant because of the low water solubility of this product.

12.4 Mobility in Soil

- Not considered mobile but soluble compounds may be produced by acidic conditions.

12.5 Results of PBT and vPvB assessment

- The PBT and vPvB criteria of Annex XIII to regulation (EC) 1907/2006 does not apply to inorganic substances.

12.6 Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste
- Recover, reclaim or recycle if practical. Refer to manufacturer/supplier for information on recovery/recycling.

Packaging waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

13.2 Other Information

- When handling waste, consideration should be made to the safety precautions applied to handling of this product.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	Not Applicable	Not Regulated	Not Applicable	Not Applicable	Not Applicable
TDG	Not Applicable	Not Regulated	Not Applicable	Not Applicable	Not Applicable
IMO/IMDG	Not Applicable	Not Regulated	Not Applicable	Not Applicable	Not Applicable
ADR/RID	Not Applicable	Not Regulated	Not Applicable	Not Applicable	Not Applicable
IATA/ICAO	Not Applicable	Not Regulated	Not Applicable	Not Applicable	Not Applicable

14.6 Special precautions for user
- No special precautions.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
- Not relevant.

Section 15 - Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications
- Chronic

State Right To Know					
Component	**CAS**	**MA**	**MN**	**NJ**	**PA**
Bismuth	7440-69-9	No	No	No	No
Cadmium	7440-43-9	Yes	Yes	Yes	Yes

Lead	7439-92-1	Yes	Yes	Yes	Yes
Tin	7440-31-5	Yes	Yes	Yes	Yes

Inventory						
Component	**CAS**	**Australia AICS**	**Canada DSL**	**China**	**EU EINECS**	**Japan ENCS**
Bismuth	7440-69-9	Yes	Yes	Yes	Yes	No
Cadmium	7440-43-9	Yes	Yes	Yes	Yes	No
Lead	7439-92-1	Yes	Yes	Yes	Yes	Yes
Tin	7440-31-5	Yes	Yes	Yes	Yes	No

Inventory (Con't.)				
Component	**CAS**	**Korea KECL**	**New Zealand**	**TSCA**
Bismuth	7440-69-9	Yes	Yes	Yes
Cadmium	7440-43-9	Yes	Yes	Yes
Lead	7439-92-1	Yes	Yes	Yes
Tin	7440-31-5	Yes	Yes	Yes

Belgium

Labor

Belgium - Substances and Preparations - Suspected Carcinogens and Mutagens

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Not Listed
• Lead	7439-92-1	

Canada

Labor

Canada - WHMIS - Classifications of Substances

• Bismuth	7440-69-9	Uncontrolled product according to WHMIS classification criteria
• Tin	7440-31-5	Uncontrolled product according to WHMIS classification criteria
• Cadmium	7440-43-9	D1A, D2A
• Lead	7439-92-1	D2A

Canada - WHMIS - Ingredient Disclosure List

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	1 %
• Cadmium	7440-43-9	0.1 %
• Lead	7439-92-1	0.1 %

Environment

Canada - CEPA - Schedule I - List of Toxic Substances

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Not Listed
• Lead	7439-92-1	

Europe

Environment

EU - Air Pollution (2001/379/EC) - Heavy Metal Pollutants

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	
• Lead	7439-92-1	

Other

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Classification

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	T+; R26 Carc.Cat.2; R45 T; R48/23/25 N; R50-53 Repr.Cat.3; R62-63 Muta.Cat.3; R68
• Lead	7439-92-1	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	T+ N R:45-26-48/23/25-62-63-68-50/53 S:53-45-60-61
• Lead	7439-92-1	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Substances and Preparations

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	E
• Lead	7439-92-1	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Phrases

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	S:53-45-60-61
• Lead	7439-92-1	Not Listed

EU - Export and Import Restrictions (689/2008) - Chemicals Subject to Export Notification Procedure

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Severe restriction as an industrial chemical for professional use
• Lead	7439-92-1	Not Listed

EU - Hazardous Substances Restricted or Prohibited in Electrical Equipment (2011/65/EU) (RoHS)

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	0.01 % maximum concentration value
• Lead	7439-92-1	0.1 % maximum concentration value

EU - Water Framework Directive (2000/60/EC) - List of Priority Substances - Annex X

• Bismuth	7440-69-9	Not Listed

• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Priority hazardous substance
• Lead	7439-92-1	Priority substance

Germany

Labor

Germany - TRGS 505 - Specific Lead Regulations

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Not Listed
• Lead	7439-92-1	Lead concentration in the blood above 300 µg/L in male employees and 100 µg/L in female employees requires additional training for personal hygiene and vigilance; Lead concentration in the blood above 350 µg/L in male employees and 200 µg/L in female employees requires additional training for personal hygiene and vigilance; Lead concentration in the blood above 400 µg/L in male employees and 300 µg/L in female employees requires additional training for personal hygiene and vigilance; See TRGS 505 for detailed regulations regarding lead and lead compounds

Environment

Germany - TA Luft - Types and Classes

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	inorganic dust Substance: 5.2.2, Class III
• Cadmium	7440-43-9	carcinogenic Substance: 5.2.7.1.1, Class I
• Lead	7439-92-1	inorganic dust Substance: 5.2.2, Class II

Germany - TA Luft - Emission Limits for Carcinogenic Substances

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	0.15 g/h Mass flow (Class I); 0.05 mg/m3 Mass concentration (Class I)
• Lead	7439-92-1	Not Listed

Germany - TA Luft - Emission Limits for Inorganic Dusts

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	5 g/h Mass flow (Class III); 1 mg/m3 Mass concentration (Class III)
• Cadmium	7440-43-9	Not Listed

• Lead	7439-92-1	2.5 g/h Mass flow (Class II); 0.5 mg/m3 Mass concentration (Class II)

Germany - Water Classification (VwVwS) - Annex 1

• Bismuth	7440-69-9	ID Number 1443, not considered hazardous to water
• Tin	7440-31-5	ID Number 1443, not considered hazardous to water
• Cadmium	7440-43-9	Not Listed
• Lead	7439-92-1	ID Number 1443, not considered hazardous to water

Other

Germany - Specifically Regulated Chemicals in TRGS

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Not Listed
• Lead	7439-92-1	TRGS 505 (February 2007)

India

Environment

India - Hazardous Chemical Rules - List of Hazardous and Toxic Chemicals

• Bismuth	7440-69-9	
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Not Listed
• Lead	7439-92-1	(high temp, molten)

Japan

Labor

Japan - ISHL Dangerous Substances

• Bismuth	7440-69-9	Ignitable substance (listed under Metallic powder)
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Not Listed
• Lead	7439-92-1	Not Listed

Malaysia

Environment

Malaysia - Environmental Quality (Industrial Effluent) Regulations - Fifth and Eighth Schedules

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	0.20 mg/L Standard A; 1.0 mg/L Standard B; 0.5 mg/L Standard A (total including Copper, Manganese, Nickel and Zinc); 3.0 mg/L Standard B (total including Copper, Manganese, Nickel and Zinc); 1.0 mg/L Standard B (soluble form, total including Copper, Manganese, Nickel and Zinc)

• Cadmium	7440-43-9	0.01 mg/L Standard A; 0.02 mg/L Standard B
• Lead	7439-92-1	0.10 mg/L Standard A; 0.5 mg/L Standard B

United Kingdom

Environment

United Kingdom - Pollution Inventory - Schedule 1 - Thresholds for Releases to Air

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	1 kg
• Lead	7439-92-1	100 kg

Other

United Kingdom - List of Dangerous Substances in Water

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	1000 g
• Lead	7439-92-1	Not Listed

United States

Labor

U.S. - OSHA - Specifically Regulated Chemicals

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	5 µg/m3 TWA (See 29 CFR 1910.1027); 2.5 µg/m3 Action Level
• Lead	7439-92-1	30 µg/m3 Action Level (See 29 CFR 1910.1025); 50 µg/m3 TWA (See 29 CFR 1910.1025)

Environment

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	10 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 4.54 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)
• Lead	7439-92-1	10 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 4.54 kg final RQ (no reporting of releases of this hazardous substance is

		required if the diameter of the pieces of the solid metal released is >100 µm)

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	0.1 % de minimis concentration
• Lead	7439-92-1	0.1 % Supplier notification limit; 0.1 % de minimis concentration (when contained in stainless steel, brass, or bronze)

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Not Listed
• Lead	7439-92-1	100 lb RT (this lower threshold does not apply to lead when it is contained in stainless steel, brass or bronze alloy)

United States - California

Labor

U.S. - California - 8 CCR Section 339 - Director's List of Hazardous Substances

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	
• Cadmium	7440-43-9	
• Lead	7439-92-1	

Environment

U.S. - California - Proposition 65 - Carcinogens List

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	carcinogen, initial date 10/1/87
• Lead	7439-92-1	carcinogen, initial date 10/1/92

U.S. - California - Proposition 65 - Developmental Toxicity

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	developmental toxicity, initial date 5/1/97
• Lead	7439-92-1	developmental toxicity, initial date 2/27/87

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	4.1 µg/day MADL (oral)
• Lead	7439-92-1	0.5 µg/day MADL

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed

• Cadmium	7440-43-9	0.05 µg/day NSRL (inhalation)
• Lead	7439-92-1	15 µg/day NSRL (oral)

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Not Listed
• Lead	7439-92-1	female reproductive toxicity, initial date 2/27/87

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	male reproductive toxicity, initial date 5/1/97
• Lead	7439-92-1	male reproductive toxicity, initial date 2/27/87

U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Category IIa
• Lead	7439-92-1	Category IIa

Other

U.S. - California - 8 CCR Section 5200-5220 - Specifically Regulated Carcinogens

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Section applies to all concentrations and exposures
• Lead	7439-92-1	Section applies to all concentrations and exposures

U.S. - California - 8 CCR Section 5203 Carcinogens

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	Reporting required
• Lead	7439-92-1	Reporting required

United States - New York

Environment

U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	1 lb RQ (air); 1 lb RQ (land/water); 10 lb RQ (air, notification is not required if the mean diameter of the particles released is >100 µm); 10 lb RQ (land/water, notification is not required if the mean diameter of the particles released is >100 µm)
		10 lb RQ (air, notification is not required if the mean diameter

• Lead	7439-92-1	of the particles released is >100 µm); 10 lb RQ (land/water, notification is not required if the mean diameter of the particles released is >100 µm)

United States - Pennsylvania

Labor

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	(dust, fume, powder)
• Lead	7439-92-1	

U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances

• Bismuth	7440-69-9	Not Listed
• Tin	7440-31-5	Not Listed
• Cadmium	7440-43-9	(powder)
• Lead	7439-92-1	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Revision Summary		
Date	**MSDS Number**	**Changes**
09/July/2015		• Section 14 changed. Changes include Removed: Transportation Information
17/October/2014		• Section 3 changed. Update of component classification and addition of SVHC statement for Cadmium. • Section 9 changed. Changes include Added:Water Solubility Physical Description • Section 15 changed. Changes include Added:SARA Hazard Classifications • Section 16 changed. Changes include Added:EU CLP Relevant health & precautionary phrases, EU DSD/DPD Relevant risk & safety phrases

Relevant Phrases (code & full text)

- H372 - Causes damage to organs through prolonged or repeated exposure.
  H330 - Fatal if inhaled
  H350 - May cause cancer.
  H360 - May damage fertility or the unborn child.
  H341 - Suspected of causing genetic defects.
  H361 - Suspected of damaging fertility or the unborn child.
  H400 - Very toxic to aquatic life
  H410 - Very toxic to aquatic life with long lasting effects

  R45 - May cause cancer.
  R61 - May cause harm to the unborn child.
  R63 - Possible risk of harm to the unborn child.
  R62 - Possible risk of impaired fertility.
  R68 - Possible risk of irreversible effects.
  R48/23/25 - Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
  R26 - Very toxic by inhalation.
  R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Classification method for mixtures	• Calculation method.
Last Revision Date	• 22/May/2015
Preparation Date	• 07/February/2014
Other Information	• Information Sources : US-EPA Ecotox databases Hazardous Substance Data Bank (HSDB®) eChemPortal Handbook of chemistry and Physics 91st Edition, W.M. Haynes NIOSH RTECS ® databases (Registry of Toxic Effects of Chemical Substances) European Chemicals Agency (ECHA) databases.
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