



This safety data sheet represents a family grouping of all metal mixes that are blended with gold. A table is provided that lists all metal groupings.

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: GOLD CONTAINING ALLOYS

SDS Number: SDS-971

Revised Date: 27 DECEMBER 2017

Product Use: Industrial Use - Alloy Metal Mixture. See alloy table for list of mixtures.

MANUFACTURER:

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2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

✓ Eye ✓ Inhalation ✓ Skin ✓ Ingestion NTP

Carcinogen listed in

IARC OSHA ✓ Not Listed
*See Section 11

GHS:

Precautionary statement(s)

P261	Avoid breathing dust/fume/gas/mist/vapors/spray
P270	Do not eat, drink or smoke when using this product
P273	Avoid release to the environment
P280	Wear protective gloves/protective clothing/eye protection/face protection
P362 +P364	Take off contaminated clothing and wash before reuse
P301 + 314	IF SWALLOWED: Get Medical advice/attention if you feel unwell
P302 +P352	IF ON SKIN: Wash with plenty of soap and water
P304 + 341	IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
P305 + 351	IF IN EYES: Rinse continuously with water for several minutes (15 mins)

POTENTIAL HEALTH EFFECTS:

- Eye Contact:** May cause irritation. Contact with powdered metal alloy or fume from molten metal may cause irritation. Severe eye damage may result from hot molten metal being splashed into the eyes.
- Ingestion:** Ingestion may cause irritation or may be harm if swallowed.
- Inhalation:** Dust may cause irritation to the respiratory tract. May be harmful if inhaled. May cause irritation.
- Skin Contact:** May cause irritation upon contact. May be harmful if absorbed through skin. Hot molten metal may cause burns to the skin. **Antimony and Nickel** – have been known to cause dermatitis. Nickel is a skin sensitizer.
- Chronic:** Review alloy listing for percentage of metal contained.
- Silver** – chronic skin contact or ingestion of silver dusts, salts or fume can result in a condition known as Argyria, a condition with bluish pigmentation of the skin and eyes.
- Indium** – may cause damage to respiratory system if inhaled over long periods of exposure.
- Copper** – over exposure to fumes may cause metal fume fever (chills, muscle aches, fever, dry throat, cough, weakness, lassitude), metallic or sweet taste, discoloration of skin and hair.
- Nickel** – toxic by ingestion. Can cause pulmonary asthma, and hypersensitivity. Suspected carcinogen. May be toxic to kidneys, lungs, liver, upper respiratory system.
- Cadmium** – toxic by inhalation. Cadmium is irritating to the respiratory tract. Cadmium is listed as a carcinogen.
- Tin**- Has been shown to increase incidence of sarcoma in animal tests.
- Note:** The Indium Corporation does not recommend, manufacture, market or endorse any of its products for human consumption.
- Warning:** Applicable in the State of California. This product contains a chemical(s) known to the State of California to cause cancer and birth defects (or other reproductive harm).(nickel, cadmium and trace levels of lead)

3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	% wt	CAS Registry #/EINECS#	PEL mg/m³	TLV-TWA mg/m³	TLV-STEL mg/m³
TIN	*	7440-31-5/231-141-8			
		(US)	2	2	-
		(EU)	-	2	4
		(Canada)	-	2	4
		(Singapore)	2	-	-
SILVER	*	7440-22-4/231-131-3			
		(US)	0.01	0.1	-
		(EU)	-	0.1	-
		(Canada)	-	0.1	0.3
		(Mexico)	-	0.1	-
		(Singapore)	0.1	-	-
GOLD	*	7440-57-5/231-165-9	N.E.	N.E.	N.E.
INDIUM	*	7440-74-6/231-180-0			
		(US)	0.1	0.1	-
		(EU)	-	0.1	0.3
		(Canada)	-	0.1	0.3
		(Mexico)	-	0.1	0.3
		(Singapore)	0.1	-	-
		(China)	-	0.1	0.3
COPPER	*	7440-50-8/231-159-6			
		(US)	0.1	0.2	-
		(EU)	-	0.2(fume)	2(dust)
		(Canada)	-	0.2	0.6
		(Mexico)	-	0.2	2
		(Singapore)	0.2(fume)	1(dust)	-
		(China)	-	0.2(fume)	0.6
ANTIMONY	*	7440-36-0/231-146-5			
		(US)	0.5	0.5	-

		(EU)	0.5	-	-
		(Canada)	-	0.5	1.5
		(Mexico)	-	5	-
		(Singapore)	0.5	-	-
		(China)	-	0.5	-
NICKEL	*	7440-02-0/231-111-4			
		(US)	1	1.5	-
		(Canada)	-	1	2
		(Mexico)	-	1	-
		(Singapore)	1	-	-
		(China)	-	1	2.5
SILICON	*	7440-21-3/231-130-8			
		(US)	15	10	-
		(Canada)	-	10	-
		(EU)	-	10	-
		(Singapore)	10	-	-
GERMANIUM	*	7440-56-4/231-164-3	N.E.	N.E.	N.E.
ZINC	*	7440-66-6/231-175-3			
			N.E.	N.E.	N.E.
CADMIUM	*	7440-43-9			
		(US)	0.005	0.01	-
		(EU)	-	0.025	-
		(Canada)	-	0.05	-
		(Singapore)	0.05	-	-
		(Mexico)	-	0.01(particulate)	-
		(China)	-	0.01	0.0
* See alloy table					
N.E. = Not Established					
TLV= time weighted average					
STEL=short term exposure limit					

4. FIRST AID MEASURES

- Eye Contact:** Hold eyelids apart and flush eyes with plenty of tepid water for at least 15 minutes. Seek medical attention if irritation persists.
- Ingestion:** If patient is conscious, ONLY induce vomiting as directed by trained personnel. NEVER give anything by mouth to an unconscious person. Seek medical attention immediately.
- Inhalation:** Remove to fresh air. If not breathing, give artificial respiration or oxygen by trained personnel. Seek immediate medical attention.
- Skin Contact:** Remove contaminated clothing. Wash affected area with soap and water. Wash clothing before reuse. If irritation persists, obtain medical attention.

5. FIRE FIGHTING MEASURES

- Flash Point:** Not established. **Method:** Not established.
- Auto-ignition Temperature:** Not applicable
- Flammable Limits:** Fine dusts and powders could be a potential explosion hazard. Avoid generation.
- Extinguishing Media:** Use extinguishers appropriate for the surrounding fire conditions. Use dry sand, sodium chloride, or dolomite. Water, A/B/C extinguishers and halogenated agents are not recommended.
- Special Fire Fighting Procedures:** Firefighters wear an approved self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

- Spill or Leak Procedures:** Wear respirator and other personal protective clothing. (See Exposure Controls/Personal Protection Section). Extinguish or remove all sources of ignition. Ventilate area. Clean up spill without generating or dispersing dust into the air. Vacuum solids instead of sweeping using a grounded unit. Reduce airborne dust and prevent scattering by moistening with water. Place spilt material in a container and dispose of in accordance with applicable regulations. Recycle where possible. Do not allow to enter the environment. May contain metals that could be harmful to the aquatic environment.

7. HANDLING AND STORAGE

- Handling Precautions:** Avoid breathing vapors from heated material and dusts from cutting or grinding. Avoid contact with eyes, skin and clothing. Follow routine safe handling procedures. Use with adequate ventilation. Avoid dust generation. Wear PPE.
- Storage Precautions:** Keep away from heat and flame. Store in suitable, tightly capped, and labeled containers in cool dry, well-ventilated area. Empty containers may be hazardous as they contain product residue.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

- Engineering Controls:** Local exhaust ventilation is required to control any air contaminants when melting, cutting burning or performing other activities where there is a potential for airborne contamination and exposure. Avoid potential breathing of fume and dust. Ensure controls are used.
- Personal protection:**
- Eyes:** Chemical safety glasses/goggles. Face shield recommended when handling molten metal and when

grinding or cutting.

- Respirator:** An authority approved or compliant marked air-purifying respirator with a fume/dust chemical cartridge is recommended under certain circumstances where airborne concentrations are expected to be elevated. Warning: Air purifying respirators do not protect the worker in oxygen-deficient atmospheres. Avoid breathing dusts and fumes.
- Skin:** Wear protective gloves. Hot gloves for handling molten metal.
- Other:** Eye-wash fountain/shower in work area. Avoid the use of contact lenses in high fume and dust areas.
- Work/Hygienic** Maintain good housekeeping. Clean up spills immediately. Good personal hygiene is essential. Avoid eating, smoking or drinking in the work area. Wash hands thoroughly with soap and water immediately upon leaving the work area. Follow established governmental guidelines when handling certain metals such as cadmium.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Solid metal	Boiling Point:	Not available
Odor:	Odorless	Melting Point:	See Table
Specific Gravity:	See Table	pH:	Not applicable
Vapor Pressure:	Not available	Solubility in Water:	Insoluble
Vapor Density:	(air=1) Not applicable.		

10. STABILITY AND REACTIVITY

General:	Stable.
Conditions to Avoid:	Heat, flame, ignition sources. Avoid dust generation.
Incompatible Materials:	Halogens, sulfur and some acids
Hazardous Decomposition / Combustion:	None
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity:	NTP (National Toxicity Program):	Yes – Nickel	
	OSHA (Occupational Safety & Health Administration):	Yes - Cadmium	
	IARC (International Agency for Research on Cancer):	Yes – Nickel and Cadmium	
LD50:	Not established.	LC50:	Not established.
Other:	Nickel RTECS# QR5950000	Cadmium RTECS# EU9800000	
	Indium RTECS#NL1050000, Silver RTECS#VW3500000, Copper RTECS#GL5325000, Antimony RTECS# CC4025000		
	Cadmium: Product contains <1% cadmium mixture.		
	Inhalation, human, 39 mg/m ³ , LCLO		
	Oral, rat, 2330 mg/kg, LD50		
	Women, inhalation, dose: 129 ug/m ³ , 20 years		
	Chronic Exposure: Teratogen/Mutagen/Reproductive Hazard		

12. ECOLOGICAL INFORMATION

Product mixture not tested. Known testing data and other information available on each metal found in chemical journals and other publications.

Product mixture could contain cadmium in <1 % of the mixture ingredients of unknown hazards to the aquatic environment.

13. DISPOSAL CONSIDERATION

Waste Disposal Method: Scrap metal alloy usually has value. Contact a commercial reclaimer for recycling. Otherwise, dispose of in accordance with all Federal, State and Local environmental regulations.

14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements. Not regulated under US DOT (United States Department of Transportation).

Solid Metal mixture:

Non hazardous under shipping.

UN- none

North American Emergency Guide Book – Not applicable

15. REGULATORY INFORMATION

The information in this Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations promulgated hereunder (29 CFR 1910.1200 ET. SEQ.).

This product has been classified in accordance with the Mexican guidelines, NOM-018-STPS-2015 and NOM-010-STPS-2014.

Regulatory Information China:

GB/T 16483-2008, GB/T 17519-2013, Safety Data Sheets for Chemical Products

GB 30000.2-29-2013, Rules for classification and labeling of chemicals (GHS)

Decree No. 591: Regulations on the Control Over Safety of Hazardous Chemicals.

This product has been classified using the Chinese Occupational Limit for Hazardous Agents in the Workplace, GBZ2-2007.

This product has been classified in accordance with: Malaysian – OCCUPATIONAL SAFETY AND HEALTH (CLASSIFICATION, LABELING AND SAFETY DATA SHEET OF HAZARDOUS CHEMICALS) REGULATION OCTOBER 2013 – (CLASS).

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation (CPR).

Canadian WHMIS: D -2AMaterials Causing Other Toxic Effects - Very Toxic Material (Chronic) (cadmium/nickel) (Toxic)
D1A – Materials causing immediate and serious toxic effects –Very Toxic Material (cadmium)



This product has been classified in accordance with the guidelines set by the Dept of Industrial Health of the Republic of Singapore.

SARA 313 Listing - 40 CFR 372.65 – Silver, Antimony, Nickel, Copper, Cadmium

All ingredients are listed on the EPA TSCA Inventory.

All ingredients are listed under the following country chemicals lists:

Canadian – DSL

Korean Inventory of Existing Chemicals

Philippine Inventory of Chemicals and Chemical Substances

New Zealand Inventory of Chemicals

Australian Inventory of Chemical Substances

European Inventory of Existing Commercial Chemical Substances

Chinese Chemical Inventory

California Prop 65 (Safe Drinking Water Standard): Warning: This product contains a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm). (Nickel, cadmium and contains trace amounts of lead)

EPA Genetic Toxicology Program - Cadmium CAS# 7440-43-9

16. OTHER INFORMATION

HMIS Hazard Rating:	Health:	2
	Fire:	1
	Physical Hazard:	0

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Alloy Table

Indalloy metal mixture	%Gold Au	%Tin Sn	%Silicon Si	%Germanium Ge	%Indium In	%Silver Ag	%Antimony Sb	%Nickel Ni	%Copper Cu	%Zinc Zn	%Cadmium Cd	RoHS 2 Compliance (2011/65/EU)	Mass Density
177 (75Au/25In)	75	-	-	-	25	-	-	-	-	-	-	Yes	13.70
178 (82Au/18In)	82	-	-	-	18	-	-	-	-	-	-	Yes	14.90
182 (80Au/20In)	80	20	-	-	-	-	-	-	-	-	-	Yes	14.51
183 (88Au/Ge12)	88	-	-	12	-	-	-	-	-	-	-	Yes	14.67
184 (96.76Au/3.24Si)	96.76	-	3.24	-	-	-	-	-	-	-	-	Yes	15.4
187 (38Au/17Ge/45Ag)	38	-	-	17	-	45	-	-	-	-	-	Yes	10.58
194 (98Au/2Si)	98	-	2	-	-	-	-	-	-	-	-	Yes	16.92
195 (80Au/20Cu)	80	-	-	-	-	-	-	-	20	-	-	Yes	15.67
196 (82Au/18Ni)	82	-	-	-	-	-	-	18	-	-	-	Yes	15.92
198 (50Au/50Ag)	50	-	-	-	-	50	-	-	-	-	-	Yes	13.60
199 (99.4Au/0.6Sb)	99.4	-	-	-	-	-	0.6	-	-	-	-	Yes	19.08
200 (100Au)	100	-	-	-	-	-	-	-	-	-	-	Yes	19.30
238 (10Au/90Sn)	10	90	-	-	-	-	-	-	-	-	-	Yes	7.78

Indalloy metal mixture	%Gold Au	%Tin Sn	%Silicon Si	%Germanium Ge	%Indium In	%Silver Ag	%Antimony Sb	%Nickel Ni	%Copper Cu	%Zinc Zn	%Cadmium Cd	RoHS 2 Compliance (2011/65/EU)	Mass Density
NS (9.5Au/90Sn/0.5Sb)	9.5	90	-	-	-	-	0.5	-	-	-	-	Yes	7.73
NS (9.5Au/90Sn/0.5Sb)	9.5	90	-	-	-	-	0.5	-	-	-	-	Yes	7.78
NS (10Au/90Sn)	10	90	-	-	-	-	-	-	-	-	-	Yes	11.05
NS (70Au/30Sn)	70	30	-	-	-	-	-	-	-	-	-	Yes	13.65
NS (73Au/27Sn)	73	27	-	-	-	-	-	-	-	-	-	Yes	13.35
NS (75Au/25Sn)	75	25	-	-	-	-	-	-	-	-	-	Yes	13.56
NS (78Au/22Sn)	78	22	-	-	-	-	-	-	-	-	-	Yes	14.16
NS (79Au/21Sn)	79	21	-	-	-	-	-	-	-	-	-	Yes	14.33
NS (79.2Au/19.8Sn/1Ag)	79.2	19.8	-	-	-	1	-	-	-	-	-	Yes	14.45
NS (81.05Au/0.62Sn/7.7Ag/7.4Ni/2.6Zn/0.63Cd)	81.05	0.62	-	-	-	7.7	-	-	7.4	2.6	0.63	No	15.92
NS (81.5Au/10Ge/8.5Ag)	81.5	-	-	10	-	8.5	-	-	-	-	-	Yes	14.47

Indalloy metal mixture	%Gold Au	%Tin Sn	%Silicon Si	%Germanium Ge	%Indium In	%Silver Ag	%Antimony Sb	%Nickel Ni	%Copper Cu	%Zinc Zn	%Cadmium Cd	RoHS 2 Compliance (2011/65/EU)	Mass Density
NS (87Au/1 2Ge/1In)	87	-	-	12	1	-	-	-	-	-	-	Yes	14.49

NS = NON STANDARD ALLOY MIX RoHS 2 – 2011/65/EU

<http://www.indium.com>