

# SDS- SAFETY DATA SHEET

This Safety Data Sheet complies with the  
U.S. OSHA Hazard Communication Standard 29CFR 1910.1200



## SECTION 1: IDENTIFICATION

**GHS Product Identifier:** Titanium and Titanium Alloys

**Synonym(s):** CP-1, CP-2, CP-3, CP-4, Ti-6Al-4V, Ti-6Al-7Nb, Ti-3Al-2.5V, Ti-6Al-6V-2Sn, Ti-15Mo, VT-16, Ti-18, Ti-3Al-8V-6Cr-4Mo-4Zr, Ti 3Al-2.5V ELI, Ti-6Al-4V ELI, Ti-Beta III, Ti-13Zr, Ti-5-5-5-3, Ti 6Al-2Sn-4Zr-2Mo, Ti-15V-3Cr-3Al-3Sn, Ti 7Al-4V, Ti-10V-2Fe-3Al

**Product use:** Aerospace, Medical, and Industrial Applications

**Manufacturer:** Perryman Company; 213 Vandale Drive, Houston, PA 15342 **Phone:** 724-746-9390 **Fax:** 724-746-9392

**Emergency phone:** Chemtrec (24 hrs) 1-800-424-9300

## SECTION 2 HAZARD(S) IDENTIFICATION

**General Hazard Statement:** Solid metallic products are generally classified as "articles" and do not constitute a hazardous material in their solid form under the definitions of the OSHA Hazard Communication Standard (29 CFR 1910.1200). Any articles manufactured from these solid products would generally be classified as non-hazardous; however some hazardous elements contained in these products could be emitted under certain processes such as burning, melting, welding, sawing, brazing, grinding and machining. Products in the solid state present no fire or explosion hazard. Small chips, fines, and dust may ignite.

**ACUTE EFFECTS:** Excessive exposure to welding fumes, gases or dust may cause irritation of eyes, nose or throat. Inhalation of dusts / fumes may result in metal fume fever (metallic taste in mouth, dryness and irritation of throat, chills and fever).

**CHRONIC EFFECTS:** Prolonged inhalation of welding fumes, gases or dusts may cause a variety of adverse health effects. These effects may include skin sensitization, neurological damage and respiratory disease such as bronchial asthma, lung fibrosis or pneumoconiosis.

**POTENTIAL HEALTH EFFECTS/MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Any pre-existing chronic respiratory condition (asthma, chronic bronchitis, emphysema) may be aggravated in some workers.

**ROUTES OF ENTRY:** Inhalation (dusts / fumes / mists), Contact with Skin and Eyes (dusts / mists), Ingestion (dusts).

## SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Components	EC Number	CAS Number	% Weight
Aluminum, Al	231-072-3	7429-90-5	0-8
Chromium, Cr	231-157-5	7440-47-3	0-6
Iron, Fe	231-096-4	7439-89-6	0-2
Molybdenum, Mo	231-107-2	7439-98-7	0-15
Niobium, Nb	231-113-5	7440-03-1	0-8
Silicon, Si	231-130-8	7440-21-3	0-1
Tin, Sn	231-141-8	7440-31-5	0-4
Titanium, Ti	231-142-3	7440-32-6	50-99.9
Vanadium, V	231-171-1	7440-62-2	0-15
Zirconium, Zr	231-176-9	7440-67-7	0-14

For exact composition, refer to analysis or material certification.

**EC** – European Community

**CAS** – Chemical Abstract Service

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## SECTION 4 FIRST AID MEASURES

**INHALATION:** Not applicable due to the solid form of the product; however, if large amounts of dust, fumes, or particulates are generated during processing, move person to fresh air. If symptoms develop, seek medical attention.

**EYE CONTACT:** Contact with dust or particulate generated during processing Immediately flush with running water to remove particulates for 15 minutes, seek medical attention.

**SKIN CONTACT:** Contact with dust or powders during processing; wash immediately with soap and water. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area, consult a physician.

**INGESTION:** Consult physician.

## SECTION 5 FIRE FIGHTING MEASURES

**FLASH POINT:** NA

**AUTOIGNITION TEMPERATURE:** NA

**FLAMMABILITY CLASSIFICATION:** NA

**FLAMMABLE LIMITS:** Nonflammable

**GENERAL FIRE HAZARD:** None for solid formed product

**EXTINGUISHING METHOD:** Use F-500 EA equipped Class "D" type fire extinguisher. Dry sand, dry graphite, or inert gas to smother the fire.

**FIRE FIGHTING EQUIPMENT:** Non-flammable. Will not support combustion. Not applicable for solid product. Use extinguishers appropriate for surrounding materials. Positive pressure SCBA and structural firefighter's protective clothing should be used at a minimum for surrounding fire.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** This solid formed product does not constitute a fire or explosion hazard. Finely divided chips may present a fire and explosion hazard in the presence of an ignition source.

**WARNING - DO NOT USE WATER or CO<sub>2</sub> EXTINGUISHERS!** These extinguishing agents may cause an explosion.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

**CLEAN UP PROCEDURES:** No special procedures needed.

**SPECIALIZED EQUIPMENT:** None.

## SECTION 7 HANDLING AND STORAGE

**HANDLING:** Avoid breathing of and contact with fumes and dust during processing. No specific requirements for solid form product.

**STORAGE:** Keep away from incompatible materials (see section 10). No specific requirements for solid form product.

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## SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

**Exposure Overview:** There are no occupational exposure limits for Titanium Alloys. Occupational exposure limits apply to some components resulting from grinding, polishing, abrasive blasting, hot rolling, hot forging, thermal cutting, or welding which may produce dust or fumes.

Chemical Components		PEL (OSHA) mg/m <sup>3</sup>		TLV (ACGIH) mg/m <sup>3</sup>
Aluminum, Al	15	Metal, total dust	10	metal dust
	5	respirable fraction	5	welding fumes
Chromium, Cr	1	Metal	0.5	metal
Iron, Fe	10	oxide dust	5	Fe <sub>2</sub> O <sub>3</sub> dust
Molybdenum, Mo	5	soluble	5	soluble
	15	Insoluble	10	insoluble
Niobium, Nb		None Established		None Established
Silicon, Si	15	total dust	10	total dust
	5	respirable fraction	5	respirable fraction
Tin, Sn	2	metal	2	metal
Titanium, Ti	15	Titanium Dioxide form, total dust	10	Titanium Dioxide form, total dust
Vanadium, V	0.5	oxide dust	5	Respirable dust or fume
	0.1	oxide fume		
Zirconium, Zr	5	Metal	5	metal

**PEL** = Permissible Exposure Limit (OSHA)  
**TLV** = Threshold Limit Value (ACGIH)

**OSHA** = Occupational Safety and Health Administration  
**ACGIH** = American Conference of Governmental Industrial Hygienists

**ENGINEERING CONTROLS:** Provide general or local exhaust to minimize airborne concentrations during milling, grinding, melting and welding operations to avoid overexposure.

**RESPIRATORY PROTECTION:** Wear NIOSH approved dust / mist / fume respirator when welding or burning this metal.

**EYE/FACE PROTECTION:** Face shields (welding or burning), Safety glasses (cutting or grinding).

**OTHER PROTECTIVE EQUIPMENT:** Use appropriate protective clothing such as welding aprons and gloves when welding or burning.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

**APPEARANCE:** Silver-gray metal  
**ODOR:** Odorless  
**PHYSICAL STATE:** Solid  
**VAPOR PRESSURE:** NA

**VAPOR DENSITY:** NA  
**MELTING POINT:** 3020°F (1660°C)  
**SOLUBILITY IN WATER:** Insoluble  
**DENSITY:** 0.160 lb/in<sup>3</sup> (4.47 g/cm<sup>3</sup>)

## SECTION 10 STABILITY AND REACTIVITY

**STABILITY:** Stable under normal conditions of use, storage and transport for solid product.

**CONDITIONS TO AVOID:** Contact with incompatible materials. Avoid creating finely divided, concentrated airborne particulates in the presence of ignition sources.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Extreme heat from fire or processing (e.g. welding, brazing, machining, etc.) may produce toxic or irritating airborne particulate, including metal and metallic oxide fumes. Reaction with water, steam, acids, etc. can evolve hydrogen, which is highly dangerous fire and explosion hazard.

**INCOMPATIBLE MATERIALS:** Acids, Oxidizing Agents, Halogens.

**HAZARDOUS POLYMERIZATION:** Will not occur.

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## SECTION 11 TOXICOLOGY INFORMATION

**LETHAL CONCENTRATION (LC50):** None established.

**REPRODUCTIVE EFFECTS:** NA

**LETHAL DOSE (LD50):** NA

**MUTAGENICITY:** NA

**TERATOGENICITY:** NA

**CARCINOGENIC BY NTP, IARC OR OSHA:** No (Note: Fumes / dusts / mists from this material may be carcinogenic if inhaled over long periods of time).

## SECTION 12 ECOLOGICAL INFORMATION

**ECOTOXICITY:** No data available for the material as a whole. However, individual components of the material have been found to be toxic to the environment. Metal dusts may migrate into soil and groundwater and be ingested by wildlife.

**ENVIRONMENTAL FATE:** No data available.

**ENVIRONMENTAL DEGRADATION:** No data available.

## SECTION 13 DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL:** Titanium scrap or solid waste should be recycled or reclaimed whenever possible.

**GENERAL INFORMATION:** Dispose of in accordance with applicable federal, provincial/state or local regulations.

## SECTION 14 TRANSPORT INFORMATION

As a solid product, these alloys are not regulated by the U.S. Department of Transportation (DOT) and the International Air Transport Association (IATA).

## SECTION 15 REGULATORY INFORMATION

This product is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200. However, dusts and fumes from this product may be combustible or hazardous and require protection to comply with applicable Federal, state and local laws and regulations.

## SECTION 16 OTHER INFORMATION

This SDS covers the mill product as shipped from our facility, but does not include chemicals that may be applied by subsequent handlers and/or distributors of this product. Additionally, specialty orders may require application of coating material not listed in this SDS. SDSs for any Perryman-applied specialty coating can be provided separately by calling our corporate facility.

The information in this Safety Data Sheet (SDS) was obtained from sources which we believe are reliable; however, the information is provided without any representation or warranty, expressed or implied, regarding the accuracy or correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of this product.

**Prepared By:** D. Closser, Manager – Environmental, Health and Safety

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