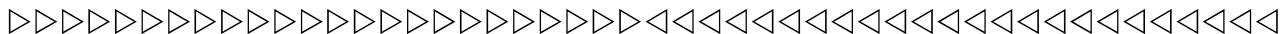


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Titan Alloy Products



**1. PRODUCT AND COMPANY IDENTIFICATION:**

**PRODUCT NAME:** Indigo

**MANUFACTURER:** Titan Alloy Products  
P.O. Box 245013  
Milwaukee WI 53224

**EMERGENCY TELEPHONE NUMBER:** 631-547-5470

**2. HAZARD IDENTIFICATION:**

**Emergency Overview:** This product is normally not considered hazardous as shipped. Avoid eye contact or inhalation of dust from the product. When this product is used in a welding process, the most important hazards are welding fumes and heat.

**Classification of the Substance/Mixture**

**CLP/GHS Classification (1272/2008):**

**Reproductive Toxicity, Category 1B**

**Hazardous to the Aquatic Environment – Long-Term Hazard, Category 1**

**EU Classification (67/548/EEC):**

**Toxic (T), Dangerous for the Environment (N), R60, R61, R50, R50/53**

**Labelling:**



**Symbols:**

**Signal Word:** Danger

**Hazard Statements:**

**H360** – May damage fertility or the unborn child.

**H410** – Very toxic to aquatic life with long lasting effects.

**Precautionary Statements:**

**P201** – Obtain special instructions before use.

**P202** – Do not handle until all safety precautions have been read and understood.

**P210** – Keep away from heat/sparks/open flames/hot surfaces – No smoking.

**P273** – Avoid release to the environment.

**P280** – Wear protective gloves/eye protection/face protection.

**P281** – Use personal protective equipment as required.

**P308+P313** – IF exposed or concerned: Get medical advice/attention.

**P391** – Collect spillage.

**P405** – Store locked up.

**P501** – Dispose of contents/container in accordance with local/regional/national/international regulations.

**3. COMPOSITION / INFORMATION ON INGREDIENTS:**

Chemical Identity	CAS #	Range %	OSHA PEL (mg/m <sup>3</sup> )	ACGIH-TLV (mg/m <sup>3</sup> )	Carcinogenicity	EU Classification (67/548/EEC)	CLP/GHS Classification (1272/2008)
Tin	7440-31-5	1-11	2	2	No	Not Dangerous	Not Hazardous
#Copper	7440-50-8	55-65	1.0	1.0	No	(F) R11	(H228) Flam. Sol. 1

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						 (N) R50	(H400) Aquatic Acute 1 
#Zinc	1314-13-2	40-50	5.0	5.0	No	 (N),R50/53	(H400) Aquatic Acute 1  (H410) Aquatic C. 1 
Iron	7439-89-6	.2-10	10 (as Fe <sub>2</sub> O <sub>3</sub> )	10 (as Fe <sub>2</sub> O <sub>3</sub> )	No	Not Dangerous	Not Hazardous
Boric Acid	10043-35-3	1-11	15	10	No	Repr. Cat. 2  (T),R60, R61	(H360FD) Repr. 1B 
Borax	1303-96-4	2-8	10	1	No	Repr. Cat. 2  (T),R60, R61	(H360FD) Repr. 1B 

**Important:** This section covers the materials of which the products manufactured. The fumes and gases produced during normal use of this product are covered in section 10. The term "Hazardous" in "Hazardous Material" should be interpreted as a term required and defined in OSHA Hazard Communication Standard 29CFR 1910-1200 and it does not necessarily imply the existence of hazard. The chemicals or compounds reportable by Section 313 of SARA are marked by the symbol #.

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## 4. FIRST AID MEASURES:

**Inhalation:** Remove to fresh air immediately or administer oxygen. Get medical attention immediately.

**Skin:** Flush skin with large amounts of water and soap. If irritation develops and persists, get medical attention.

**Eye:** Flush eyes with water for at least 15 minutes. Get medical attention.

**Ingestion:** Obtain medical attention immediately if ingested. Rinse mouth.

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## 5. FIRE-FIGHTING MEASURES:

**Suitable Extinguishing Media:** Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use the extinguishing media recommended for the burning material and fire situation.

**Unsuitable Extinguishing Media:** Do not use water on molten metal. Large fires may be flooded with water from a distance.

**Specific Hazards Arising From Chemical:** Keep away from heat/spark/open flames/hot surfaces – No smoking.

Tin oxides, Copper oxides, Carbon oxides, Zinc oxides, Iron oxides, Borane/boron oxides, Sodium oxides

**Protective Equipment:** Fire fighters should wear complete protective clothing including self-contained breathing apparatus.

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## 6. ACCIDENTAL RELEASE MEASURES:

**Personal Precautions:** Refer to section 8.

**Environment Precautions:** Refer to section 13.

**Cleaning Measures:** As an inert solid waste in accordance with state, local, and federal regulations.

**California:** Sodium Tetraborate Decahydrate is a "hazardous waste" in California and should be handled in accordance with state regulations.

**EPA Hazardous Waste Number:** None

**RCRA (40 CFR 261):** Sodium Tetraborate Decahydrate is not listed under any sections of the Federal Resource Conservation and Recovery Act.

**Water Spill:** Sodium Tetraborate Decahydrate will cause localized contamination of surrounding waters based on the quantity dissolved in these waters. At high concentrations, some damage to local vegetation, fish, and other aquatic life may be expected. Advise the local water authority that none of the affected water should be used for irrigation or for potable water until natural dilution returns boron level to normal.

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## 7. HANDLING AND STORAGE:

**Precautions for Safe Handling:** Keep container tightly sealed. Store in cool, dry location in tightly closed containers. Ensure good ventilation at the workplace. Open and handle the container with care.

**Conditions for Safe Storage:** Store away from oxidizing agents. Keep container tightly sealed. Store at room temperature. Store in cool dry conditions in well sealed containers.

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## 8. EXPOSURE CONTROLS/ PERSONAL PROTECTION:

**Engineering Controls:** The usual precautionary measures for handling chemicals should be followed. Keep away from food, beverages and feed. Remove all soiled and contaminated clothing immediately. Wash hands before break and at the

end of the work. Store all protective clothing separately. Maintain an ergonomically appropriate working environment. Wear protective equipment. Keep unprotected persons away. Avoid causing dust.

**Exposure limits:** Use industrial hygiene equipment to ensure that exposure does not exceed applicable national exposure limits. The limits defined under section 3 can be used as guidance. Unless noted, all values are for 8 hour time weighted average.

**Biological limits:** No available data

#### **Personal protection:**

**Respiratory protection:** Use an air purifying dust respirator when welding or brazing in a confined space, or when local exhaust or ventilation is not sufficient to keep exposure values within safe limits.

**Hands protection:** Wear appropriate gloves to prevent skin contact.

#### **EN 12477: Protection gloves for welders**

Requirements (EN Levels)	Type A	Type B
Abrasion (Cycles)	2 (500)	1 (100)
Cut (Factor)	1 (1.2)	1 (1.2)
Tear (Newton)	2 (25)	1 (10)
Puncture (Newton)	2 (60)	1 (20)
Burning Behaviour	3	2
Contact Heat	1	1
Convective Heat	2	-
Small Splashes	3	2
Dexterity	1 (11)	4 (6.5)

Type B gloves are recommended when high dexterity is required as for TIG welding, while type A gloves are recommended for other welding processes. The contact temp ( $^{\circ}\text{C}$ ) is 100 and the threshold time (seconds) >15.

**Eyes protection:** Welder's helmet or face shield with colour absorbing lenses. Shield and filter to provide protection from harmful UV radiation, infra red and molten metal approved to standard EN379. Filter shade to be a minimum of shade 9.

**Skin protection:** Heat-resistant protective clothing. Wear safety boots, apron, arm and shoulder protection. Keep protective clothing clean and dry. Clothing should be selected to suit the level, duration and purpose of the welding activity.

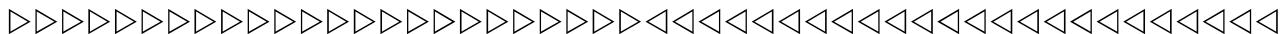
Class 1	
Impact of Spatter	15 Drops
Heat Transfer (radiation)	RHTI 24 ≥ 7 seconds
Process	<p>Manual welding with light formation of spatter and drops</p> <ul style="list-style-type: none"> <li>• Gas Welding</li> <li>• TIG Welding</li> <li>• MIG Welding</li> <li>• Micro plasma welding</li> <li>• Braze welding</li> <li>• Spot Welding</li> <li>• MMA Welding (with rutile-covered electrode)</li> </ul>
Environmental Conditions	<p>Operation of machines</p> <ul style="list-style-type: none"> <li>• Oxygen cutting machines</li> <li>• Plasma cutting machines</li> <li>• Resistance welding machines</li> <li>• Machines for thermal spraying</li> <li>• Bench welding</li> </ul>

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Class 2	
<b>Impact of Spatter</b>	<b>25 Drops</b>
<b>Heat Transfer (radiation)</b>	<b>RHTI 24 ≥ 16 seconds</b>
<b>Process</b>	<p>Manual welding with heavy formation of spatter and drops</p> <ul style="list-style-type: none"> <li>• MMA welding (with basic or cellulose-covered electrodes)</li> <li>• MAG welding (with CO<sub>2</sub> or mixed gases)</li> <li>• MIG Welding (with high current)</li> <li>• Self shielded flux core arc welding</li> <li>• Plasma cutting</li> <li>• Gouging</li> <li>• Oxygen cutting</li> <li>• Thermal spraying</li> </ul>
<b>Environmental Conditions</b>	<p>Operation of machines</p> <ul style="list-style-type: none"> <li>• In confined spaces</li> <li>• At overhead welding/cutting or in comparable constrained positions</li> </ul>

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## 9. PHYSICAL AND CHEMICAL PROPERTIES:

**Appearance:** Solid**Color:** Blue/ 3175- pink/ 3176- white/ 3370-none/ 3375- none/3470- none/ 3475-none.**Odour:** Odourless**Odour Threshold:** Not Available**pH Value:** Not Available**Specific Gravity:** Not Available**Melting Point/Melting Range:** 1560-2000° F, 850-1100° C**Freezing Point:** Not Available**Boiling Point/Boiling Range:** Not Available**Flash point:** Not Available**Evaporation Rate:** Not Available**Self-inflammability:** Not Available**Explosion limits:** Not Available**Vapour pressure:** Not Available**Vapour density:** Not Available**Density at 20°C:** Not Available**Relative density:** 6-9 g/cm<sup>3</sup>**Solubility:** Insoluble in water.**Partition coefficient:** Not Available**Auto-ignition temperature:** Not Available**Decomposition temperature:** Not Available**Other Information:** No available data.

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## 10. STABILITY AND REACTIVITY:

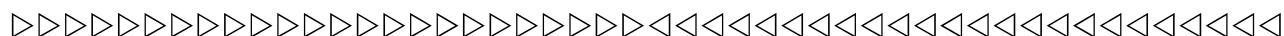
**Chemical Stability:** This product is stable under normal conditions. This product loses H<sub>2</sub>O when heated.**Hazardous Reactions:** Contact with chemical substances like acids or strong bases cause generation of gas.**Conditions to Avoid:** Not applicable.**Incompatible Materials:** Oxidizing agents. Reaction with strong reducing agents such as metal hydrides, acetic anhydride or alkali metals will generate hydrogen gas which could create an explosive hazard.**Hazardous Decomposition Products:** Boric oxide fumes.

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**11. TOXICOLOGICAL INFORMATION:**

**Acute Effects:** Overexposure to brazing and soldering fumes may result in symptoms like metal fume fever, dizziness, nausea, dryness or irritation of the nose, throat or eyes. Tin: May cause skin irritation. May cause eye irritation due to mechanical action. Inhalation of tin dust may cause respiratory tract and mucous membrane tract irritation due to mechanical action. It is poorly absorbed from the digestive tract. It can cause gastrointestinal tract disturbance which may be irritant or astringent on the stomach. Symptoms of systematic copper poisoning may include: capillary damage, headache, cold sweat, weak pulse, kidney and liver damage, central nervous system excitation followed by depression, jaundice, convulsions, paralysis and coma. Signs and symptoms of zinc exposure are central nervous system depression, cough, chest pain and difficulty breathing. Exposure to high airborne concentrations can cause anaesthetic effects. Toxicity reported for borates in humans: ingestion or absorption may cause nausea, vomiting, diarrhea, abdominal cramps, and erythematous lesions on the skin and mucous membranes. Other symptoms include: circulatory collapse, tachycardia, cyanosis, delirium, convulsions and coma. Death has been reported to occur in infants from less than 5 grams and in adults from 5 to 20 grams.

LD/LC50 Values that are relevant for classification		
<b>Copper 7440-50-8</b>		
Oral	LD50	>2000 mg/kg (rat)
Dermal	LD50	>2000 mg/kg (rat)
Inhalation	LC50	>5.11 mg/L/4 hr (rat)
Intraperitoneal	LD50	3.5 mg/kg (mouse)

LD/LC50 Values that are relevant for classification		
<b>Zinc 7440-66-6</b>		
Oral	LD50	630 mg/kg (rat)

LD/LC50 Values that are relevant for classification		
<b>Iron 7439-89-6</b>		
Oral	LD50	30000 mg/kg (rat)

LD/LC50 Values that are relevant for classification		
<b>Boric Acid 10043-35-3</b>		
Oral	LD50	2660 mg/kg (rat)
	LC50	53.2 mg/l (21d) (water flea)

LD/LC50 Values that are relevant for classification		
<b>Borax 1303-96-4</b>		
Oral	LD50	2660 mg/kg (rat)
Dermal	LD50	10000 mg/kg (rabbit)

**Chronic Effects:** Overexposure to brazing and soldering fumes may affect pulmonary function. Chronic copper poisoning is typified by hepatic cirrhosis, brain damage and demyelination, kidney defect and copper deposition in the cornea as exemplified by humans with Wilson's disease. It has also been reported that copper poisoning has led to haemolytic anemia and accelerates arteriosclerosis, damage to the lungs, vomiting, diarrhoea, abdominal pain and blood disorders. Excessive inhalation of zinc oxide fumes may produce symptoms known as "Zinc Shakes" which are flu-like and usually cease when the individual is removed from the source. Prolonged or repeated exposure can cause vomiting, diarrhoea, lung irritation.

**12. ECOLOGICAL INFORMATION:**

**Toxicity:** No available data.

**Persistence and Degradability:** No available data.



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Federal Food, Drug and Cosmetic Act: Pursuant to 21 CFR 175.105, 176.180 and 181.30, Sodium Tetraborate

Pentahydrate is approved by the FDA for use in adhesive components of packaging materials, as a component of paper coatings on such materials, or for use in the manufacture, thereof, which materials are expected to come in contact with dry food products.

**Chemical Inventory Listing**

US EPA TSCA 1330-43-4

Canadian DSL 1330-43-4

EINECS 215-540-4

South Korea 1-760

Japanese MITI (1)-69

**Federal Food, Drug, and Cosmetic ACT:**

Pursuant to 21 CFR 175.105, 176.108 and 181.30, Sodium Tetraborate

Decahydrate is approved by the FDA for use in adhesive components of packaging materials, as a component of paper coatings on such materials

or for use in the manufacture, thereof, which materials are expected to come in contact with dry food products

**EPCRA/SARA Title III Toxic Chemicals**

The following metallic components are listed as SARA 313 "Toxic Chemicals" and potential subject to annual SARA reporting. See Section 3 for weight percentage.

Ingredient Name	Disclosure Threshold
Copper	1.0 mg/m <sup>3</sup>
Zinc	5.0 mg/m <sup>3</sup>

**16. OTHER INFORMATION:**

The information in this document is believed to be correct as of the date issued. However, no warranty is expressed to be implied regarding the accuracy or completeness of this information. This information and product are furnished on the condition that the person receiving them shall make his own determinations as to the suitability of the product for his particular purpose and on the condition that he assumes the risk of his use thereof.

This Material Safety Data Sheet complies with the EC directives 91/155/EEC and 93/112/EEC, including modifications 2001/58/EC.

Complies with OSHA Communication Standard 29 CFR 1910.1200 and Superfund Amendments and Reauthorization Act (SARA) of 1986 Public Law 99-499

**Hazard Statements:**

**H228** – Flammable Solid.

**H360** – May damage fertility or the unborn child

**H400** – Very toxic to aquatic life.

**H410** – Very toxic to aquatic life with long lasting effects.

**R-Phrases:**

**R11** – Highly flammable.

**R50** – Very toxic to aquatic organisms.

**R50/53** – Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**R60** – May impair fertility.

**R61** – May cause harm to the unborn child.

**S-Phrases:**

**S16** – Keep away from source of ignition – No smoking.

**S26** – In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

**S45** – In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**S53** – Avoid exposure – obtain special instructions before use.

**S60** – This material and its container must be disposed of as hazardous waste.

**S61** – Avoid release to the environment.

End of the document.