

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

### \* 1 Identification

· **Product Identifier**

· **Trade name:** *AlTiCrN, AlCrTiN, ALL4®*

· **Relevant identified uses of the substance or mixture and uses advised against:**

· **Product Description**

This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.

· **Details of the Supplier of the Safety Data Sheet:**

· **Manufacturer/Supplier:**

PLATIT, Inc.  
 1840 Industrial Drive, Suite 220  
 Libertyville, IL 60048-9466  
 PHONE: (847) 680-5270 (For product information)  
 FAX: (847) 680-5271  
 EMAIL: usa@platit.com

· **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

### 2 Hazard(s) Identification

· **Classification of the substance or mixture:**

The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.

· **Label elements:**

· **GHS label elements:** Non-Regulated Material

· **Hazard pictograms:** Non-Regulated Material

· **Signal word:** Non-Regulated Material

· **Hazard statements:** Non-Regulated Material

· **Unknown acute toxicity:**

20 % of the mixture consists of component(s) of unknown toxicity.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



· **HMIS-ratings (scale 0 - 4)**

HEALTH	1	Health = 1
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

· **Hazard(s) not otherwise classified (HNOC):** None known

### \* 3 Composition/Information on Ingredients

· **Chemical characterization: Mixtures**

· **Description:** Mixture: consisting of non-regulated material.

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**Trade name: AITiCrN, AICrTiN, ALL4®**

· <b>Dangerous Components:</b>		
CAS: 7429-90-5 RTECS: BD 0330000	Aluminium ⚠ Flam. Sol. 2, H228	40-80%
CAS: 7440-47-3 RTECS: GB 4200000	Chromium ⚠ Acute Tox. 4, H302; Acute Tox. 4, H312; Skin Irrit. 2, H315; Eye Irrit. 2B, H320	10-30%
CAS: 7440-32-6 RTECS: XR 1700000	Titanium ⚠ Skin Sens. 1, H317; Eye Irrit. 2B, H320	10-30%

· **Additional information:** AITiCrN, AICrTiN, ALL4® coating accounts for less than 1% of complete part or tool.

### 4 First-Aid Measures

- **Description of first aid measures:**
- **General information:** No special measures required.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If swallowed and symptoms occur, consult a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**  
No further relevant information available.

### 5 Fire-Fighting Measures

- **Extinguishing media:**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Advice for firefighters:**
- **Protective equipment:**  
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

### 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**  
Dispose of the collected material according to regulations.
- **Reference to other sections:**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and Storage

- **Handling**
- **Precautions for safe handling:** No special measures required.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** No special requirements.

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**Trade name: AlTiCrN, AlCrTiN, ALL4®**

- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s):** No further relevant information available.

### 8 Exposure Controls/Personal Protection

- **Additional information about design of technical systems:** No further data; see section 7.

· **Control parameters:**

· **Components with occupational exposure limits:**

**7429-90-5 Aluminium**

PEL	Long-term value: 15*; 5** mg/m <sup>3</sup> *Total dust; ** Respirable fraction
REL	Long-term value: 10* 5** mg/m <sup>3</sup> as Al*Total dust**Respirable/pyro powd./welding f.
TLV	Long-term value: 1* mg/m <sup>3</sup> as Al; *as respirable fraction

**7440-47-3 Chromium**

PEL	Long-term value: 1* 0.5** mg/m <sup>3</sup> *metal;**inorganic compds., as Cr
REL	Long-term value: 0.5* mg/m <sup>3</sup> *metal+inorg.compds.as Cr;See Pocket Guide App. C
TLV	Long-term value: 0.5 mg/m <sup>3</sup>

- **Additional information:** The lists that were valid during the creation of this SDS were used as basis.
- **Exposure controls:**
- **Personal protective equipment:**
- **General protective and hygienic measures:** No special measures required.
- **Breathing equipment:** Not required.
- **Protection of hands:** Not required.
- **Material of gloves:** Not required.
- **Penetration time of glove material:** Not applicable.
- **Eye protection:** Not required.

### 9 Physical and Chemical Properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

- |   |                   |
|---|-------------------|
| · <b>Form:</b>                          | Solid             |
| · <b>Color:</b>                         | Metallic          |
| · <b>Odor:</b>                          | Odorless          |
| · <b>Odor threshold:</b>                | Not determined.   |
| · <b>pH-value:</b>                      | Not applicable.   |
| · <b>Change in condition</b>            |                   |
| · <b>Melting point/Melting range:</b>   | Not determined.   |
| · <b>Boiling point/Boiling range:</b>   | 2460 °C (4460 °F) |
| · <b>Flash point:</b>                   | None              |
| · <b>Flammability (solid, gaseous):</b> | Not determined.   |

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**Trade name: AITiCrN, AICrTiN, ALL4®**

- **Ignition temperature:** 400 °C (752 °F)
- **Decomposition temperature:** Not determined.
- **Auto igniting:** Product is not self-igniting.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:**
  - Lower:** Not determined.
  - Upper:** Not determined.
- **Vapor pressure:** Not applicable.
- **Density @ 20 °C (68 °F):** 3.96 g/cm<sup>3</sup> (33.046 lbs/gal)
- **Relative density:** Not determined.
- **Vapor density:** Not applicable.
- **Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with:**
  - Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - Dynamic:** Not applicable.
  - Kinematic:** Not applicable.
- **Solvent content:**
  - Organic solvents:** 0.0 %
  - Solids content:** 100.0 %
- **Other information:** No further relevant information available.

### 10 Stability and Reactivity

- **Reactivity:** No further relevant information available.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** Toxic chromium oxide fumes.

### 11 Toxicological Information

- **Information on toxicological effects:**
- **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

**7429-90-5 Aluminium**

Oral	LD50	>2000 mg/kg (rat)
Inhalative	LC50/4 h	888 mg/l (rat)

- **Primary irritant effect:**
- **On the skin:** No irritating effect.
- **On the eye:** No irritating effect.

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**Trade name: AITiCrN, AICrTiN, ALL4®**

· **Additional toxicological information:**

The product is not subject to classification according to internally approved calculation methods for preparations.

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

· **Carcinogenic categories:**

· **IARC (International Agency for Research on Cancer):**

- Group 1 - Carcinogenic to humans
- Group 2A - Probably carcinogenic to humans
- Group 2B - Possibly carcinogenic to humans
- Group 3 - Not classifiable as to its carcinogenicity to humans
- Group 4 - Probably not carcinogenic to humans

7440-47-3	Chromium	3
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· **NTP (National Toxicology Program):**

None of the ingredients are listed.

· **OSHA-Ca (Occupational Safety & Health Administration):**

None of the ingredients are listed.

### 12 Ecological Information

· **Toxicity:**

· **Aquatic toxicity:**

**7440-47-3 Chromium**

EC50 0.07 mg/l (Water flea)

· **Persistence and degradability:** No further relevant information available.

· **Behavior in environmental systems:**

· **Bioaccumulative potential:** No further relevant information available.

· **Mobility in soil:** No further relevant information available.

· **Additional ecological information:**

· **General notes:**

Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.

· **Results of PBT and vPvB assessment:**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Other adverse effects:** No further relevant information available.

### 13 Disposal Considerations

· **Waste treatment methods:**

· **Recommendation:**

Smaller quantities can be disposed of with household waste.

Observe all federal, state and local environmental regulations when disposing of this material.

· **Uncleaned packagings**

· **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport Information

· **UN-Number:**

· **DOT, ADR, ADN, IMDG, IATA**

Non-Regulated Material

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**Trade name: AITiCrN, AICrTiN, ALL4®**

- **UN proper shipping name:** Non-Regulated Material
- **DOT, ADR, ADN, IMDG, IATA**
- **Transport hazard class(es):**
- **DOT, ADR, ADN, IMDG, IATA**
- **Class:** Non-Regulated Material
- **Packing group:**
- **DOT, ADR, IMDG, IATA** Non-Regulated Material
- **Environmental hazards:** Not applicable.
- **Special precautions for user:** Not applicable.
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.
- **UN "Model Regulation":** Non-Regulated Material

### 15 Regulatory Information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture:**
- **SARA (Superfund Amendments and Reauthorization):**

<b>Section 355 (extremely hazardous substances):</b>
None of the ingredients are listed.

<b>Section 313 (Specific toxic chemical listings):</b>
7429-90-5 Aluminium
7440-47-3 Chromium

<b>TSCA (Toxic Substances Control Act):</b>
All ingredients are listed or exempt from listing.

<b>California Proposition 65:</b>
<b>Chemicals known to cause cancer:</b>
None of the ingredients are listed.

<b>Chemicals known to cause reproductive toxicity for females:</b>
None of the ingredients are listed.

<b>Chemicals known to cause reproductive toxicity for males:</b>
None of the ingredients are listed.

<b>Chemicals known to cause developmental toxicity:</b>
None of the ingredients are listed.

<b>New Jersey Right-to-Know List:</b>
All ingredients are listed.

<b>New Jersey Special Hazardous Substance List:</b>		
7429-90-5 Aluminium		F3, R1
7440-47-3 Chromium		F3
7440-32-6 Titanium		F3, R1

<b>Pennsylvania Right-to-Know List:</b>
None of the ingredients are listed.

<b>Pennsylvania Special Hazardous Substance List:</b>		
7429-90-5 Aluminium		E
7440-47-3 Chromium		ES

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**Trade name: AITiCrN, AICrTiN, ALL4®**

· **Carcinogenic categories:**

· **EPA (Environmental Protection Agency):**

7440-47-3	Chromium	D
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· **TLV (Threshold Limit Value established by ACGIH):**

7429-90-5	Aluminium	A4
7440-47-3	Chromium	A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health):**

None of the ingredients are listed.

- **GHS label elements:** Non-Regulated Material
- **Hazard pictograms:** Non-Regulated Material
- **Signal word:** Non-Regulated Material
- **Hazard statements:** Non-Regulated Material

· **National regulations:**

The product is subject to be classified according with the latest version of the regulations on hazardous substances.

- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

### 16 Other Information

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

- **Date of preparation / last revision:** 04/06/2016 / 2

· **Abbreviations and acronyms:**

- ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road
- ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- ACGIH: American Conference of Governmental Industrial Hygienists
- EINECS: European Inventory of Existing Commercial Chemical Substances
- ELINCS: European List of Notified Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- NFPA: National Fire Protection Association (USA)
- HMIS: Hazardous Materials Identification System (USA)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- PBT: Persistent, Bioaccumulative and Toxic
- vPvB: very Persistent and very Bioaccumulative
- NIOSH: National Institute for Occupational Safety
- OSHA: Occupational Safety & Health
- TLV: Threshold Limit Value
- PEL: Permissible Exposure Limit
- REL: Recommended Exposure Limit
- BEI: Biological Exposure Limit
- Flam. Sol. 2: Flammable solids, Hazard Category 2
- Acute Tox. 4: Acute toxicity, Hazard Category 4
- Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
- Eye Irrit. 2B: Serious eye damage/eye irritation, Hazard Category 2B
- Skin Sens. 1: Sensitisation - Skin, Hazard Category 1

- **\* Data compared to the previous version altered.**

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Reviewed on 04/06/2016

### 1 Identification

· **Product Identifier**

· **Trade name:** **CBC, DLC1, DLC2, CROMVlc®**, -Vlc®

· **Relevant identified uses of the substance or mixture and uses advised against:**

· **Product Description**

This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.

· **Details of the Supplier of the Safety Data Sheet:**

· **Manufacturer/Supplier:**

PLATIT, Inc.

1840 Industrial Drive, Suite 220

Libertyville, IL 60048-9466

PHONE: (847) 680-5270 (For product information)

FAX: (847) 680-5271

EMAIL: usa@platit.com

· **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

### 2 Hazard(s) Identification

· **Classification of the substance or mixture:**

The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.

· **Label elements:**

· **GHS label elements:** Non-Regulated Material

· **Hazard pictograms:** Non-Regulated Material

· **Signal word:** Non-Regulated Material

· **Hazard statements:** Non-Regulated Material

· **Unknown acute toxicity:**

95 % of the mixture consists of component(s) of unknown toxicity.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



· **HMIS-ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

· **Hazard(s) not otherwise classified (HNOC):** None known

### 3 Composition/Information on Ingredients

· **Non-hazardous components:**

CAS: 7440-44-0	Carbon	60-95%
RTECS: FF 5250100		

· **Chemical characterization: Mixtures**

· **Description:** Mixture of substances listed below with non-hazardous additions.

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**Trade name: CBC, DLC1, DLC2, CROMVic®, -Vic®**

<b>· Dangerous Components:</b>		
CAS: 7440-21-3	Silicon ⚠ Flam. Sol. 2, H228; ⚠ Acute Tox. 4, H302; Eye Irrit. 2B, H320	0-20%
CAS: 7440-47-3 RTECS: GB 4200000	Chromium ⚠ Acute Tox. 4, H302; Acute Tox. 4, H312; Skin Irrit. 2, H315; Eye Irrit. 2B, H320	0-20%

**· Additional information:**

CBC, DLC1, DLC2, CROMVic®, -Vic® coating accounts for less than 1% of complete part or tool.

### 4 First-Aid Measures

**· Description of first aid measures:**

- **General information:** No special measures required.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If swallowed and symptoms occur, consult a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**  
No further relevant information available.

### 5 Fire-Fighting Measures

**· Extinguishing media:**
**· Suitable extinguishing agents:**

 CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

**· Special hazards arising from the substance or mixture:**

Amorphous or crystalline silicon both react exothermically when heated with alkali-metal carbonates attaining incandescence and evolving carbon monoxide.

Material in powder form, capable of creating a dust explosion. Mixture of silicon, aluminum, and lead oxide explodes when heated.

Moderate fire hazard when it is in the form of a dust (powder) and burns rapidly when heated in flame.

Chromium is attacked vigorously by fused potassium chlorate producing vivid incandescence. Pyrophoric chromium unites with nitric oxide with incandescence. Incandescent reaction with nitrogen oxide or sulfur dioxide.

**Special Remarks on Explosion Hazards:**

Powdered Chromium metal +fused ammonium nitrate may react violently or explosively. Powdered Chromium will explode spontaneously in air.

**· Advice for firefighters:**
**· Protective equipment:**

As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

### 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.

- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.

**· Methods and material for containment and cleaning up:**

Dispose of the collected material according to regulations.

**· Reference to other sections:**

See Section 7 for information on safe handling.

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**Trade name: CBC, DLC1, DLC2, CROMVic®, -Vic®**

See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and Storage

- **Handling**
- **Precautions for safe handling:** No special measures required.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s):** No further relevant information available.

### 8 Exposure Controls/Personal Protection

- **Additional information about design of technical systems:** No further data; see section 7.
- **Control parameters:**

· **Components with occupational exposure limits:**

#### 7440-21-3 Silicon

PEL Long-term value: 15\* 5\*\* mg/m<sup>3</sup>  
\*total dust \*\*respirable fraction

REL Long-term value: 10\* 5\*\* mg/m<sup>3</sup>  
\*total dust \*\*respirable fraction

TLV TLV withdrawn

#### 7440-47-3 Chromium

PEL Long-term value: 1\* 0.5\*\* mg/m<sup>3</sup>  
\*metal;\*\*inorganic compds., as Cr

REL Long-term value: 0.5\* mg/m<sup>3</sup>  
\*metal+inorg.compds.as Cr;See Pocket Guide App. C

TLV Long-term value: 0.5 mg/m<sup>3</sup>

- **Additional information:** The lists that were valid during the creation of this SDS were used as basis.
- **Exposure controls:**
- **Personal protective equipment:**
- **General protective and hygienic measures:** No special measures required.
- **Breathing equipment:** Not required.
- **Protection of hands:** Not required.
- **Material of gloves:** Not required.
- **Penetration time of glove material:** Not applicable.
- **Eye protection:** Not required.

### 9 Physical and Chemical Properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**
  - Form:** Solid
  - Color:** Black
  - Odor:** Odorless

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**Trade name: CBC, DLC1, DLC2, CROMVic®, -Vic®**

- **Odor threshold:** Not determined.
- **pH-value:** Not applicable.
- **Change in condition**
  - Melting point/Melting range:** Not determined.
  - Boiling point/Boiling range:** 2355 °C (4271 °F)
- **Flash point:** None
- **Flammability (solid, gaseous):** Not determined.
- **Ignition temperature:** 580 °C (1076 °F)
- **Decomposition temperature:** Not determined.
- **Auto igniting:** Product is not self-igniting.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:**
  - Lower:** Not determined.
  - Upper:** Not determined.
- **Vapor pressure:** Not applicable.
- **Density @ 20 °C (68 °F):** 5.555 g/cm<sup>3</sup> (46.356 lbs/gal)
- **Relative density:** Not determined.
- **Vapor density:** Not applicable.
- **Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with:**
  - Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - Dynamic:** Not applicable.
  - Kinematic:** Not applicable.
- **Solvent content:**
  - Organic solvents:** 0.0 %
  - Solids content:** 100.0 %
- **Other information:** No further relevant information available.

**\*10 Stability and Reactivity**

- **Reactivity:** No further relevant information available.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No known hazardous reactions
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** Toxic chromium oxide fumes.

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**Trade name: CBC, DLC1, DLC2, CROMVic®, -Vic®**

### \* 11 Toxicological Information

· **Information on toxicological effects:**

· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

**7440-21-3 Silicon**

Oral	LD50	3160 mg/kg (rat)
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· **Primary irritant effect:**

· **On the skin:** No irritating effect.

· **On the eye:** No irritating effect.

· **Additional toxicological information:**

The product is not subject to classification according to internally approved calculation methods for preparations.

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

· **Carcinogenic categories:**

· **IARC (International Agency for Research on Cancer):**

Group 1 - Carcinogenic to humans

Group 2A - Probably carcinogenic to humans

Group 2B - Possibly carcinogenic to humans

Group 3 - Not classifiable as to its carcinogenicity to humans

Group 4 - Probably not carcinogenic to humans

7440-47-3	Chromium	3
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· **NTP (National Toxicology Program):**

None of the ingredients are listed.

· **OSHA-Ca (Occupational Safety & Health Administration):**

None of the ingredients are listed.

### 12 Ecological Information

· **Toxicity:**

· **Aquatic toxicity:**

**7440-47-3 Chromium**

EC50	0.07 mg/l (Water flea)
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· **Persistence and degradability:** No further relevant information available.

· **Behavior in environmental systems:**

· **Bioaccumulative potential:** No further relevant information available.

· **Mobility in soil:** No further relevant information available.

· **Additional ecological information:**

· **General notes:**

Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.

· **Results of PBT and vPvB assessment:**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Other adverse effects:** No further relevant information available.

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Reviewed on 04/06/2016

**Trade name: CBC, DLC1, DLC2, CROMVic®, -Vic®**

### 13 Disposal Considerations

- **Waste treatment methods:**
- **Recommendation:**  
Smaller quantities can be disposed of with household waste.  
Observe all federal, state and local environmental regulations when disposing of this material.
- **Uncleaned packagings**
- **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport Information

- **UN-Number:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **UN proper shipping name:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **Transport hazard class(es):**
- **DOT, ADR, ADN, IMDG, IATA**
- **Class:** Non-Regulated Material
- **Packing group:**
- **DOT, ADR, IMDG, IATA** Non-Regulated Material
- **Environmental hazards:** Not applicable.
- **Special precautions for user:** Not applicable.
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.
- **UN "Model Regulation":** Non-Regulated Material

### 15 Regulatory Information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture:**
- **SARA (Superfund Amendments and Reauthorization):**

· <b>Section 355 (extremely hazardous substances):</b>	
None of the ingredients are listed.	
· <b>Section 313 (Specific toxic chemical listings):</b>	
7440-47-3	Chromium
· <b>TSCA (Toxic Substances Control Act):</b>	
All ingredients are listed or exempt from listing.	
· <b>California Proposition 65:</b>	
· <b>Chemicals known to cause cancer:</b>	
None of the ingredients are listed.	
· <b>Chemicals known to cause reproductive toxicity for females:</b>	
None of the ingredients are listed.	
· <b>Chemicals known to cause reproductive toxicity for males:</b>	
None of the ingredients are listed.	
· <b>Chemicals known to cause developmental toxicity:</b>	
None of the ingredients are listed.	
· <b>New Jersey Right-to-Know List:</b>	
7440-21-3	Silicon

(Contd. on page 7)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: CBC, DLC1, DLC2, CROMVic®, -Vic®**

7440-47-3	Chromium	
<b>· New Jersey Special Hazardous Substance List:</b>		
7440-21-3	Silicon	F3
7440-47-3	Chromium	F3
<b>· Pennsylvania Right-to-Know List:</b>		
7440-21-3	Silicon	
7440-47-3	Chromium	
<b>· Pennsylvania Special Hazardous Substance List:</b>		
7440-47-3	Chromium	ES
<b>· Carcinogenic categories:</b>		
<b>· EPA (Environmental Protection Agency):</b>		
7440-47-3	Chromium	D
<b>· TLV (Threshold Limit Value established by ACGIH):</b>		
7440-47-3	Chromium	A4
<b>· NIOSH-Ca (National Institute for Occupational Safety and Health):</b>		
None of the ingredients are listed.		
<ul style="list-style-type: none"> <li>· <b>GHS label elements</b> Non-Regulated Material</li> <li>· <b>Hazard pictograms:</b> Non-Regulated Material</li> <li>· <b>Signal word:</b> Non-Regulated Material</li> <li>· <b>Hazard statements:</b> Non-Regulated Material</li> </ul>		
<b>· National regulations:</b>		
The product is subject to be classified according with the latest version of the regulations on hazardous substances.		
<ul style="list-style-type: none"> <li>· <b>Chemical safety assessment:</b> A Chemical Safety Assessment has not been carried out.</li> </ul>		

### 16 Other Information

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

· **Date of preparation / last revision:** 04/06/2016 / 3

· **Abbreviations and acronyms:**

- ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road
- ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- ACGIH: American Conference of Governmental Industrial Hygienists
- EINECS: European Inventory of Existing Commercial Chemical Substances
- ELINCS: European List of Notified Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- NFPA: National Fire Protection Association (USA)
- HMS: Hazardous Materials Identification System (USA)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- PBT: Persistent, Bioaccumulative and Toxic
- vPvB: very Persistent and very Bioaccumulative
- NIOSH: National Institute for Occupational Safety
- OSHA: Occupational Safety & Health
- TLV: Threshold Limit Value
- PEL: Permissible Exposure Limit

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: CBC, DLC1, DLC2, CROMVic®, -Vic®**

REL: Recommended Exposure Limit

BEI: Biological Exposure Limit

Flam. Sol. 2: Flammable solids, Hazard Category 2

Acute Tox. 4: Acute toxicity, Hazard Category 4

Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2

Eye Irrit. 2B: Serious eye damage/eye irritation, Hazard Category 2B

· **\* Data compared to the previous version altered.**

SDS created by MSDS Authoring Services [www.msdsauthoring.com](http://www.msdsauthoring.com) +1-877-204-9106

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

### 1 Identification

- **Product Identifier**
- **Trade name: CrN**
- **CAS Number:**  
24094-93-7
- **EC number:**  
246-016-3
- **Relevant identified uses of the substance or mixture and uses advised against:**
- **Product Description**  
This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.
- **Details of the Supplier of the Safety Data Sheet:**
- **Manufacturer/Supplier:**  
PLATIT, Inc.  
1840 Industrial Drive, Suite 220  
Libertyville, IL 60048-9466  
PHONE: (847) 680-5270 (For product information)  
FAX: (847) 680-5271  
EMAIL: usa@platit.com
- **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

### 2 Hazard(s) Identification

- **Classification of the substance or mixture:**  
The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.
- **Label elements:**
- **GHS label elements:** Non-Regulated Material
- **Hazard pictograms:** Non-Regulated Material
- **Signal word:** Non-Regulated Material
- **Hazard statements:** Non-Regulated Material
- **Unknown acute toxicity:**  
100 % of the mixture consists of component(s) of unknown toxicity.
- **Classification system:**
- **NFPA ratings (scale 0 - 4)**



- **HMS-ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

- **Hazard(s) not otherwise classified (HNOC):** None known

### 3 Composition/Information on Ingredients

- **Chemical characterization: Substance**
- **CAS No. Description**  
24094-93-7 Chromium (III) nitride

(Contd. on page 2)



## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: CrN**

- **Identification number(s)**
- **EC number:** 246-016-3
- **Additional information:** CrN coating accounts for less than 1% of complete part or tool.

### 4 First-Aid Measures

- **Description of first aid measures:**
- **General information:** No special measures required.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If swallowed and symptoms occur, consult a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**  
No further relevant information available.

### 5 Fire-Fighting Measures

- **Extinguishing media:**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Advice for firefighters:**
- **Protective equipment:**  
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

### 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**  
Dispose of the collected material according to regulations.
- **Reference to other sections:**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and Storage

- **Handling**
- **Precautions for safe handling:** No special measures required.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s):** No further relevant information available.

### 8 Exposure Controls/Personal Protection

- **Additional information about design of technical systems:** No further data; see section 7.

(Contd. on page 3)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

Trade name: CrN

· **Control parameters:**

· **Components with occupational exposure limits:**

24094-93-7 Chromium (III) nitride

PEL Short-term value: 0.5 mg/m<sup>3</sup>

· **Additional information:** The lists that were valid during the creation of this SDS were used as basis.

· **Exposure controls:**

· **Personal protective equipment:**

· **General protective and hygienic measures:** No special measures required.

· **Breathing equipment:** Not required.

· **Protection of hands:** Not required.

· **Material of gloves:**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· **Penetration time of glove material:** Not applicable.

· **Eye protection:** Not required.

### 9 Physical and Chemical Properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

Form: Solid

Color: Dark

· **Odor:** Odorless

· **Odor threshold:** Not determined.

· **pH-value:** Not applicable.

· **Change in condition**

Melting point/Melting range: 1800 °C (3272 °F)

Boiling point/Boiling range: Not determined.

· **Flash point:** None

· **Flammability (solid, gaseous):** Product is not flammable.

· **Ignition temperature:** Not determined.

· **Decomposition temperature:** Not determined.

· **Auto igniting:** Not determined.

· **Danger of explosion:** Product does not present an explosion hazard.

· **Explosion limits:**

Lower: Not determined.

Upper: Not determined.

· **Vapor pressure:** Not applicable.

· **Density @ 20 °C (68 °F):** 5.9 g/cm<sup>3</sup> (49.236 lbs/gal)

· **Relative density:** Not determined.

· **Vapor density:** Not applicable.

· **Evaporation rate:** Not applicable.

(Contd. on page 4)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: CrN**

- **Solubility in / Miscibility with:**
  - Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - Dynamic:** Not applicable.
  - Kinematic:** Not applicable.
- **Organic solvents:** 0.0 %
- **Solids content:** 100.0 %
- **Other information:** No further relevant information available.

### 10 Stability and Reactivity

- **Reactivity:** No further relevant information available.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

### 11 Toxicological Information

- **Information on toxicological effects:**
- **Acute toxicity:**
- **Primary irritant effect:**
- **On the skin:** No irritating effect.
- **On the eye:** No irritating effect.
- **Additional toxicological information:**  
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.  
The substance is not subject to classification.
- **Carcinogenic categories:**

· <b>IARC (International Agency for Research on Cancer):</b>
--

Substance is not listed.
--------------------------

· <b>NTP (National Toxicology Program):</b>
---

Substance is not listed.
--------------------------

· <b>OSHA-Ca (Occupational Safety &amp; Health Administration):</b>
---

Substance is not listed.
--------------------------

### 12 Ecological Information

- **Toxicity:**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability:** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential:** No further relevant information available.
- **Mobility in soil:** No further relevant information available.

(Contd. on page 5)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: CrN**

· **Additional ecological information:**

· **General notes:**

Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.

· **Results of PBT and vPvB assessment:**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Other adverse effects:** No further relevant information available.

### 13 Disposal Considerations

· **Waste treatment methods:**

· **Recommendation:**

Smaller quantities can be disposed of with household waste.

Observe all federal, state and local environmental regulations when disposing of this material.

· **Uncleaned packagings**

· **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport Information

· **UN-Number:**

· **DOT, ADR, ADN, IMDG, IATA**

Non-Regulated Material

· **UN proper shipping name:**

· **DOT, ADR, ADN, IMDG, IATA**

Non-Regulated Material

· **Transport hazard class(es):**

· **DOT, ADR, ADN, IMDG, IATA**

· **Class:**

Non-Regulated Material

· **Packing group:**

· **DOT, ADR, IMDG, IATA**

Non-Regulated Material

· **Environmental hazards:**

Not applicable.

· **Special precautions for user:**

Not applicable.

· **Transport in bulk according to Annex II of**

**MARPOL73/78 and the IBC Code:**

Not applicable.

· **UN "Model Regulation":**

Non-Regulated Material

### 15 Regulatory Information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture:**

· **SARA (Superfund Amendments and Reauthorization):**

· **Section 355 (extremely hazardous substances):**

Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**

Substance is not listed.

· **TSCA (Toxic Substances Control Act):**

Substance is listed.

· **California Proposition 65:**

· **Chemicals known to cause cancer:**

Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**

Substance is not listed.

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: CrN**

<ul style="list-style-type: none"> <li>· <b>Chemicals known to cause reproductive toxicity for males:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Chemicals known to cause developmental toxicity:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>New Jersey Right-to-Know List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>New Jersey Special Hazardous Substance List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Pennsylvania Right-to-Know List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Pennsylvania Special Hazardous Substance List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Carcinogenic categories:</b></li> </ul>
<ul style="list-style-type: none"> <li>· <b>EPA (Environmental Protection Agency):</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>TLV (Threshold Limit Value established by ACGIH):</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>NIOSH-Ca (National Institute for Occupational Safety and Health):</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>GHS label elements</b> Non-Regulated Material</li> <li>· <b>Hazard pictograms:</b> Non-Regulated Material</li> <li>· <b>Signal word:</b> Non-Regulated Material</li> <li>· <b>Hazard statements:</b> Non-Regulated Material</li> </ul>
<ul style="list-style-type: none"> <li>· <b>National regulations:</b></li> </ul>
<ul style="list-style-type: none"> <li>Non-Regulated Material</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Chemical safety assessment:</b> A Chemical Safety Assessment has not been carried out.</li> </ul>

**16 Other Information**

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

· **Date of preparation / last revision:** 04/06/2016 / 2

· **Abbreviations and acronyms:**

- ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road
- ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- ACGIH: American Conference of Governmental Industrial Hygienists
- EINECS: European Inventory of Existing Commercial Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- NFPA: National Fire Protection Association (USA)
- HMIS: Hazardous Materials Identification System (USA)
- LD50: Lethal dose, 50 percent
- PBT: Persistent, Bioaccumulative and Toxic
- vPvB: very Persistent and very Bioaccumulative
- NIOSH: National Institute for Occupational Safety
- OSHA: Occupational Safety & Health

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: CrN**

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

LC50: Lethal concentration, 50 percent

BEI: Biological Exposure Limit

· **\* Data compared to the previous version altered.**

SDS created by MSDS Authoring Services [www.msdsauthoring.com](http://www.msdsauthoring.com) +1-877-204-9106

# Crystallume

## SAFETY DATA SHEET

### TUNGSTEN CARBIDE WITH COBALT BINDER COATED WITH DIAMOND

#### 1. Product and Company Identification

Part Number/Trade Name: Tungsten Carbide With Cobalt Binder Coated With Diamond

Company Name: Crystallume Corporation

Company Address: 3397 De La Cruz Boulevard, Santa Clara, CA 95054 USA

Company's Info Ph #: 1-800-789-4322

Date SDS Prepared: April 26, 2018

**CAUTION:** Cutting, sharpening, or grinding hardmetal products and tools produces dust or mist that, at levels above the occupational exposure limit, could cause permanent respiratory disease, and can irritate nose, throat, skin and eyes. Hardmetal products and tools should not be reground or sharpened without taking appropriate safety measures to contain dust and to prevent the inhalation of dust. Hardmetal products and tools may break or shatter in use. To avoid injury, use personal protective equipment, including eye protection.

#### 2. Hazards Identification

**DISCLAIMER:** As sold, Tungsten Carbide With Cobalt Binder Coated With Diamond does not present inhalation, ingestion or other chemical hazards. However, operations such as grinding, cutting, burning and welding of such products may release **HARDMETAL IN THE FORM OF DUSTS OR FUMES**, which may present health hazards. The health hazards described below relate to only those operations that release hardmetal and its individual components, such as tungsten carbide and cobalt dusts or fumes.

##### 2.1. GHS-US Classification

Acute Tox. 4 (Oral) H302

Resp. Sens. 1 H334

Skin Sens. 1 H317

Carc. 2 H351

Repr. 2 H361

##### 2.2. Label Elements GHS-US Labeling



Hazard Pictograms (GHS-US) : GHS07

GHS08

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) :

H302 - Harmful if swallowed. H317 - May cause an allergic skin reaction.

H334 - May cause an allergy or asthma symptoms or breathing difficulties if inhaled.

H351 - Suspected of causing cancer.

H361 - Suspected of damaging fertility or the unborn child. Precautionary Statements (GHS-US) :  
 P201 - Obtain special instructions before use.  
 P202 - Do not handle until all safety precautions have been read and understood.  
 P261 - Avoid breathing dust.  
 P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.  
 P270 - Do not eat, drink or smoke when using this product.  
 P272 - Contaminated work clothing must not be allowed out of the workplace. P280 - Wear protective gloves, protective clothing, and eye protection.  
 P284 - [In case of inadequate ventilation] wear respiratory protection.  
 P301+P312 - If swallowed: Call a poison center or doctor if you feel unwell.  
 P302+P352 - If on skin: Wash with plenty of water.  
 P304+P341 - If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing.  
 P308+P313 - If exposed or concerned: Get medical advice/attention.  
 P321 - Specific treatment (see Section 4 on this SDS).  
 P330 - Rinse mouth.  
 P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.  
 P342+P311 - If experiencing respiratory symptoms: Call a poison center or doctor.  
 P363 - Wash contaminated clothing before reuse.  
 P405 - Store locked up.  
 P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations.

2.3. Other Hazards Inhalation of dusts and fumes can cause metal fume fever. Symptoms can include a metallic or sweet taste in the mouth, sweating, shivering, headache, throat irritation, fever, chills, thirstiness, muscle aches, nausea, vomiting, weakness, fatigue, and shortness of breath. Exposure may aggravate pre-existing eye, skin, or respiratory conditions.

### 3. Composition/Information on Ingredients

Ingredient	Proprietary	%	NIOSH(RTECS) Number	CAS Number	OSHA PEL	ACGIH TLV
<b>Tungsten Carbide</b>	no	30-97	YO7250000	12070-12-1	5 MG/M3	5 MG/M3
<b>Cobalt</b>	no	6-10	GF8750000	7440-48-4	0.1 MG/M3;AS CO	0.05 MG/M3;DUST 9293
<b>Diamond</b>	no	1-5		N/A	NOT ESTABLISHED	NOT ESTABLISHED
<b>Tantalum Carbide</b>	no	0.1-15	1002631TC	12070-06-3	NOT ESTABLISHED	NOT ESTABLISHED
<b>Titanium Carbide</b>	no	0.1-15	1002632TC	12070-08-5	NOT ESTABLISHED	NOT ESTABLISHED
<b>Niobium Carbide</b>	no	0.1-5	1002633NC	12069-94-2	NOT ESTABLISHED	NOT ESTABLISHED

### 4. First-Aid Measures

- a. If overexposure to dusts and mists from grinding occurs, have SDS and label information available and contact a poison control center or seek medical attention immediately.
- b. First Aid Procedures: Eye Contact: Flush eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15 to 20 minutes). If irritation persists, seek medical attention. Skin Contact: If irritation or rash occurs, thoroughly wash affected area with soap and water and isolate from exposure. Inhalation: If symptoms of pulmonary involvement develop (i.e. coughing, wheezing, shortness of breath), remove from exposure and seek medical attention. Ingestion: If substantial quantities are swallowed, dilute with a large amount of water, induce vomiting, and seek medical attention.



- c. Note to Physicians: Medical Conditions aggravated by long term exposure include chronic pulmonary, upper respiratory tract, and skin disorders. Target Organs: Respiratory system, skin, bladder, kidneys, and eyes. Primary Routes of Entry: Skin contact, eye contact, inhalation, ingestion.

## 5. Fire-Fighting Measures

- a. Flammable Properties: Hard cemented carbides are not a fire hazard, however dusts and mists generated in grinding operations may present a fire or explosion hazard when exposed to high temperatures or ignition sources. Particle size and dispersion in air determine reactivity. However, this is not expected to be a problem under normal handling conditions. Flash Point: None Auto-Ignition: Not applicable Lower Flammable Limit (LFL): Not applicable Upper Flammable Limit (UFL): Not applicable
- b. Extinguishing Media: Suitable
- Extinguishing Media: Remove oxygen by sealing container or by smothering with dry sand, dry dolomite, or powdered sodium chloride; use an ABC type fire extinguisher or flood with water. ! Move container from fire area if possible. ! For massive fire in cargo area, use unmanned hose holder or monitor nozzles, or else withdraw and let fire burn out.
  - Unsuitable Extinguishing Media: Not applicable
- c. Protection of Firefighters
- Specific Hazards Arising from Chemicals. May generate toxic metal fumes when heated.
  - Protective Equipment and Precautions for Firefighters. For a fire contained to a small area, use a respirator approved for toxic dust and fumes. For a large fire, firefighters should use self-contained breathing apparatus.

## 6. Accidental Release Measures

- a. Personal Precautions: If airborne dust is present, use personal protection recommended in Section 8.
- b. Environmental Precautions: Material is not hazardous to the environment.
- c. Methods for Containment: Not Applicable
- d. Methods for Clean-Up: Clean up using methods that avoid dust generation such as a vacuum with HEPA filter, wet mop, or wipe. Place in suitable clean, dry container for later disposal or reclamation.
- e. Other Information: Not Applicable

## 7. Handling and Storage

- a. **Handling:**
- Avoid dispersion of grinding dust and mist into the air.
  - Do not breathe dust.
  - Avoid contact with skin, eyes, or clothing.
  - Wash hands thoroughly after handling, before eating or smoking.
  - Do not shake clothing, rags, or other items to remove dust.
  - Dust should be removed by washing or vacuuming.
- b. **Storage:**
- Material should be stored in a clean, cool area.
  - Keep away from sparks and ignition sources.

## 8. Exposure Controls/Personal Protection

Ingredient	OSHA PEL	ACGIH TLV
<b>Tungsten Carbide</b>	5 MG/M3	5 MG/M3
<b>Cobalt</b>	0.1 MG/M3;AS CO	0.05 MG/M3;DUST 9293
<b>Diamond</b>	NOT ESTABLISHED	NOT ESTABLISHED
<b>Tantalum Carbide</b>	NOT ESTABLISHED	NOT ESTABLISHED
<b>Titanium Carbide</b>	NOT ESTABLISHED	NOT ESTABLISHED
<b>Niobium Carbide</b>	NOT ESTABLISHED	NOT ESTABLISHED

- Respiratory Protection: IF ENGINEERING CONTROLS OR NON-ROUTINE USE OR EMERGENCY OCCURS; USE NIOSH/MSHA APPROVED RESPIRATOR. USE IN ACCORDANCE WITH 29 CFR 1910.134.
- Ventilation: USE ADEQUATE MECHANICAL VENTILATION OR LOCAL EXHAUST TO MAINTAIN EXPOSURE BELOW PEL/TLV.
- Protective Gloves: WORK GLOVES OR BARRIER CREAMS
- Eye Protection: SAFETY GLASSES W/SIDE SHIELDS
- Other Protective Equipment: CLOTHING TO PREVENT PROLONGED OR REPEATED CONTACT. EYE WASH STATION RECOMMENDED.
- Work Hygienic Practices: WASH HANDS AFTER USE AND BEFORE EATING, DRINKING, OR SMOKING. LAUNDRY CONTAMINATED CLOTHES BEFORE REUSE.
- Supplementary Safety & Health Data: CONTACT LENSES SHOULD NOT BE WORN WHEN USING THIS PRODUCT.

## 9. Physical and Chemical Properties

<b>Tungsten Carbide with Cobalt Binder</b>	<b>Diamond Coating</b>
Appearance And Odor: GRAY POWDER OR SOLID	Appearance And Odor: Dark Gray to Clear, NO ODOR
Boiling Point: 5198F, 2870C	Boiling Point: 1400C
Melting Point: 2723F, 1495C	Melting Point: 2700C
Vapor Pressure (MM Hg/70 F): UNKNOWN	Specific Gravity: 4.8-5.9 (WATER=1)
Vapor Density (Air=1): UNKNOWN	Solubility In Water: NOT SOLUBLE
Specific Gravity: >9.5(WATER=1)	Percent Volatile: NOT VOLATILE
Decomposition Temperature: UNKNOWN	
Evaporation Rate And Ref: NEGLIGIBLE	
Solubility In Water: NEGLIGIBLE	
Corrosion Rate (IPY): UNKNOWN	

## 10. Stability and Reactivity

- Stability: YES
- Conditions to avoid(Stability): CONTACT WITH INCOMPATIBLE MATERIALS. CONTACT OF DIAMOND WITH STRONG OXIDIZERS MAY CAUSE FIRE OR EXPLOSION
- Materials To Avoid: CHLORINE TRIFLUORIDE, FLUORINE, OXIDES OF NITROGEN, IODINE PENTAFLUORIDE, LEAD OXIDE, AMMONIUM NITRATE, ACETYLENE, STRONG ACIDS
- Hazardous Decomp Products: ACRID SMOKE AND IRRITATING FUMES
- Hazardous Poly Occur: NO
- Conditions To Avoid (Poly): NONE

## 11. Toxicological Information

- Eye Contact: Can cause irritation or conjunctivitis
- Skin Contact: Can cause irritation or allergic skin rash due to cobalt sensitization. Certain skin conditions, such as dry skin, may be aggravated by exposure.

- c. Inhalation: Cobalt: Dusts or mists can cause irritation of the nose and throat. Inhalation can result in an allergic reaction in individuals previously sensitized, causing difficult breathing. Dusts or mists also have the potential for causing transient or permanent respiratory or pulmonary diseases, including occupational asthma, pulmonary fibrosis, and interstitial pneumonitis in some individuals. It is reported that cobalt dust is the most probable cause of such respiratory diseases. Reports have also indicated a lack of correlation between onset of symptoms, length of exposure, and the development of interstitial pneumonitis. Symptoms may include a productive cough, wheezing, shortness of breath, chest tightness, dyspnea, and retrosternal pain
- d. Ingestion: Ingestion of significant amounts of cobalt has the potential of causing blood, heart, and other organ problems. The LD50 for cobalt is 6,171 mg/kg (oral, rat).
- e. Conditions Aggravated by Exposure: Lung and other pulmonary and skin conditions may be aggravated by exposure.

## **12. Ecological Information**

No data available.

## **13. Disposal Considerations**

- a. Steps If Material is Released/Spill:
  - SWEEP UP WITH MINIMUM OF DUST GENERATION.
  - PLACE IN A CONTAINER FOR LATER DISPOSAL.
  - USE OF HEPA VACUUM OR WET CLEAN-UP RECOMMENDED.
- b. Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
- c. Waste Disposal Method: SEND TO RECLAMATION FACILITY IF FEASIBLE. DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
- d. Precautions-Handling/Storing: STORE IN A COOL, DRY PLACE. MINIMIZE FREE FALL OF POWDER AND AVOID DISPERSION OF DUST IN AIR. KEEP AWAY FROM SPARKS AND OPEN FLAME.
- e. Other Precautions: DO NOT SHAKE CLOTHING, RAGS, OR OTHER ITEMS TO REMOVE DUST. DUST SHOULD BE REMOVED BY WASHING OR VACUUMING. PERIODIC MEDICAL EXAMINATIONS ARE RECOMMENDED FOR INDIVIDUALS REGULARLY EXPOSED TO DUST, FUME OR MIST.

## **14. Transport Information**

DOT Proper Shipping Name: NOT REGULATED

Disposal: Dispose according to Federal, State, and City Regulation.

## **15. Regulatory Information**

SARA Title III: Hazard categories are Chronic.

This product contains the following EPCRA section 313 chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to Know Act of 1986 (40 CFR 372)

<u>CAS Number</u>	<u>Chemical Name</u>	<u>Percent By Weight</u>
7440-48-4	Cobalt	6 – 10 %

**California Prop 65:**

Cobalt Metal Powder CAS#7440-48-4 is listed under proposition 65 as a chemical known to the State of California to cause cancer. As sold, Tungsten Carbide With Cobalt Binder Coated With Diamond does not present inhalation, ingestion or other chemical hazards. However, when using cutting tools for cutting, sanding, drilling, or grinding materials dust particles may be created. A careful study should be conducted and a proposition 65 occupational warning sign must be posted if occupational exposure to cobalt powder is present in the workplace.

**16. Other Information**

CERCLA Ratings (Scale 0-3): Health 0 Fire 0 Reactivity 0 Persistence 0

Crystallume Corporation makes no representations regarding the accuracy or completeness of the information contained herein, and assumes no liability or responsibility in connection with the information contained herein or for any loss, damage, injury of any kind including death which may result from or arise out of the use of or reliance on this information or any products or materials. The buyer assumes all risk in connection with the use and handling of the products and materials.

# TiN-BIOCOMPATIBILITY SHEET

## Medthin<sup>VT</sup> AEF by IONBOND

IONBOND has developed Medthin<sup>VT</sup> AEF, a medical grade PVD coating. Medthin<sup>VT</sup> AEF is a wear resistant titanium nitride coating (TiN) which has exceptionally high hardness and wear resistant properties. Medthin<sup>VT</sup> AEF has a 'golden' colour which provides a contrast to metallic surfaces used in many medical applications.

Medthin<sup>VT</sup> AEF has been certified to be biocompatible based on a series of tests conducted by an independent biological testing laboratory. The biocompatibility tests were conducted in accordance with ISO 10993-1 guidelines for materials which experience short term body contact. The results indicate that Medthin<sup>VT</sup> AEF is an acceptable coating for external and internal medical devices that come into contact with bone, skin, tissue, or blood.

Biocompatibility tests completed include:

SENSITIZATION:	No significant evidence of causing delayed dermal contact sensitization in guinea pigs
CYTOTOXICITY:	No evidence of causing cytotoxicity
ACUTE SYSTEMIC TOXICITY:	No mortality or evidence of significant systemic toxicity
INTRACUTANEOUS REACTIVITY:	No evidence of significant irritation or toxicity in rabbits
GENOTOXICITY:	Non mutagenic
MUSCLE IMPLANTATION:	Non-irritating to muscle tissue
HEMOLYSIS:	Nonhemolytic, compatible with blood
PYROGEN TEST:	Nonpyrogenic. The total rise of rabbit temperature during 3 hour observation period was within acceptable limits.

Medthin<sup>VT</sup> AEF is one of a range of biocompatible coatings offered by IONBOND. Other IONBOND coatings used on medical devices including amongst others: Medthin<sup>VT</sup> AEN (ZrN), Medthin<sup>VT</sup> AHE (CrN), and Medthin<sup>VT</sup> AFI (TiAlN). Medthin<sup>VT</sup> AEF is recommended for surgical instruments and other medical devices which experience problems with wear. Medthin<sup>VT</sup> AEF can also be used as a decorative coating and to color code instruments.

Medthin<sup>VT</sup> AEF improves the wear. It has a uniform, smooth as-deposited surface finish with an aesthetic golden color.

The properties of Medthin<sup>VT</sup> / ~~AEF~~ are listed below:

- COATING PROCESS : PVD
- HARDNESS;(HV):<sup>1</sup> 2900±200
- ADHESION (N):<sup>2</sup> 70
- OXIDATION TEMPERATURE (°C):<sup>3</sup> > 500°C (950°F)
- COEFFICIENT OF FRICTION:<sup>4</sup> 0.6
- SURFACE ROUGHNESS (MICRONS):<sup>5</sup> 0.2
- COLOR Gold

Medthin<sup>VT</sup> / ~~AEF~~ is deposited at low temperature using IONBOND's environmentally clean process. In the IONBOND process, arc evaporation is used to create a highly ionized plasma that allows for the deposition of adherent coatings at temperatures as low as 200°C (400°F). The low deposition temperature of the IONBOND process allows titanium nitride coating of common surgical instrument materials such as the 300 series, 400 series, and precipitation hardened stainless steels.

1) Vickers; hardness test at 50 gf load.

2) Critical normal force in newtons required to detach coating. Measured by scratch test.

3) Determined by coated specimen weight gain.

4) Measured between 100Cr6 ball and coated substrate.

5) Measured by Dektak surface profilometer in micrometers.

## For USA

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# AlTiN-BIOCOMPATIBILITY SHEET

## AlTiN by Ionbond

IONBOND has developed Medthin<sup>VT</sup> AlTiN, a new medical grade PVD coating. Medthin<sup>VT</sup> AlTiN is a wear resistant aluminium titanium nitride coating (AlTiN) which has exceptionally high hardness, excellent oxidation resistance and a low coefficient of friction. Medthin<sup>VT</sup> AlTiN has a dark grey-black color, which provides low reflectance to surgical instruments and other medical devices.

Medthin<sup>VT</sup> AlTiN has been certified to be biocompatible based on a series of tests conducted by an independent biological testing laboratory. The biocompatibility tests were conducted in accordance with ISO 10993-1 guidelines for materials which experience short term body contact. The results indicate that Medthin<sup>VT</sup> AlTiN is an acceptable coating for external and internal medical devices that come into contact with bone, skin, tissue, or blood.

Biocompatibility tests completed include:

SENSITIZATION:	No significant evidence of causing delayed dermal contact sensitization in guinea pigs
CYTOTOXICITY:	No evidence of causing cell lysis or toxicity
ACUTE SYSTEMIC TOXICITY, T12	No significant systemic toxicity or mortality
INTRACUTANEOUS TOXICITY, T13	No evidence of significant irritation or toxicity in rabbits
AMES MUTAGENICITY:	Not mutagenic
USP MUSCLE IMPLANTATION, T14	Non-irritating to muscle tissue
HEMOLYSIS:	Nonhemolytic, compatible with blood
PYROGEN TEST, T10:	Nonpyrogenic. The total rise of rabbit temperature during 3 hour observation period was within acceptable limits.

Medthin<sup>VT</sup> AlTiN is one of a range of biocompatible coatings offered by IONBOND. Other IONBOND coatings used on medical devices including amongst others: Medthin<sup>VT</sup> TiN (TiN), Medthin<sup>VT</sup> CrN (CrN), and Medthin<sup>VT</sup> TiAlN (TiAlN). Medthin<sup>VT</sup> AlTiN is recommended for surgical instruments and other medical devices which experience problems with oxidation, corrosion, wear, or a combination of these. Medthin<sup>VT</sup> AlTiN can also be used as a decorative coating and to color code instruments.

Medthin<sup>VT</sup> / ~~AG~~ improves the wear and oxidation resistance of stainless steel at both room temperature and elevated temperature. It has a uniform, smooth as-deposited surface finish with an aesthetic grey-black color. When deposited as a matt surface, it provides a low reflectance finish.

The properties of Medthin<sup>VT</sup> / ~~AG~~ are listed below:

- 
- COATING PROCESS : PVD
- HARDNESS;(HV):<sup>1</sup> 3500±500
- ADHESION (N):<sup>2</sup> 80
- OXIDATION TEMPERATURE (°C):<sup>3</sup> > 450°C (800°F)
- COEFFICIENT OF FRICTION:<sup>4</sup> 0.4
- SURFACE ROUGHNESS (MICRONS):<sup>5</sup> 0.15
- COLOR Grey-Black

Medthin<sup>VT</sup> / ~~AG~~ is deposited at low temperature is using IONBOND's environmentally clean process. In the IONBOND process, arc evaporation used to create a highly ionized plasma that allows for deposition of adherent coating at temperatures as low as 200°C (~400°F). The low deposition temperature of the IONBOND process allows aluminium titanium nitride coating of common surgical instrument materials such as the 300 series, 400 series, and precipitation hardened stainless steels.

1) Vickers; hardness test at 50 gf load.

2) Critical normal force in newtons required to detach coating. Measured by scratch test.

3) Determined by coated specimen weight gain.

4) Measured between 100Cr6 ball and coated substrate.

5) Measured by Dektak surface profilometer in micrometers.

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# Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

## 1 Identification

· **Product Identifier**

· **Trade name:** nACo®, TiXCo®

· **Relevant identified uses of the substance or mixture and uses advised against:**

· **Product Description**

This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.

· **Details of the Supplier of the Safety Data Sheet:**

· **Manufacturer/Supplier:**

PLATIT, Inc.  
 1840 Industrial Drive, Suite 220  
 Libertyville, IL 60048-9466  
 PHONE: (847) 680-5270 (For product information)  
 FAX: (847) 680-5271  
 EMAIL: usa@platit.com

· **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

## 2 Hazard(s) Identification

· **Classification of the substance or mixture:**

The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.

· **Label elements:**

· **GHS label elements:** Non-Regulated Material

· **Hazard pictograms:** Non-Regulated Material

· **Signal word:** Non-Regulated Material

· **Hazard statements:** Non-Regulated Material

· **Unknown acute toxicity:**

46.4 % of the mixture consists of component(s) of unknown toxicity.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



· **HMIS-ratings (scale 0 - 4)**



· **Hazard(s) not otherwise classified (HNOC):** None known

## 3 Composition/Information on Ingredients

· **Non-hazardous components:**

25583-20-4	Titanium nitride	35-50%
12033-89-5	Silicon Nitride	5-15%

· **Chemical characterization: Mixtures**

· **Description:** Mixture of substances listed below with non-hazardous additions.

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## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: nACo®, TiXCo®**

<b>· Dangerous Components:</b>			
CAS: 7429-90-5 RTECS: BD 0330000	Aluminium	 Flam. Sol. 2, H228	50-65%

· **Additional information:** nACo®, TiXCo® coating accounts for less than 1% of complete part or tool.

### 4 First-Aid Measures

- **Description of first aid measures:**
- **General information:** No special measures required.
- **After inhalation:** Not expected as a result of exposure to finished product.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Not expected as a result of exposure to finished product.
- **After swallowing:** Not anticipated under normal use.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**  
No further relevant information available.

### 5 Fire-Fighting Measures

- **Extinguishing media:**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Advice for firefighters:**
- **Protective equipment:**  
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

### 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**  
Dispose of the collected material according to regulations.
- **Reference to other sections:**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and Storage

- **Handling**
- **Precautions for safe handling:** No special measures required.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** Store in the original container.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s):** No further relevant information available.

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## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: nACo®, TiXCo®**

### \* 8 Exposure Controls/Personal Protection

- **Additional information about design of technical systems:** No further data; see section 7.
- **Control parameters:**
- **Components with occupational exposure limits:**  
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists that were valid during the creation of this SDS were used as basis.
- **Exposure controls:**
- **Personal protective equipment:**
- **General protective and hygienic measures:** No special measures required.
- **Breathing equipment:** Not required.
- **Protection of hands:** Not required.
- **Material of gloves:** Not required.
- **Penetration time of glove material:** Not applicable.
- **Eye protection:** Not required.

### 9 Physical and Chemical Properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**
  - Form:** Solid
  - Color:** Violet-blue
- **Odor:** Odorless
- **Odor threshold:** Not determined.
- **pH-value:** Not applicable.
- **Change in condition**
  - Melting point/Melting range:** Not determined.
  - Boiling point/Boiling range:** 2460 °C (4460 °F)
- **Flash point:** None
- **Flammability (solid, gaseous):** Not determined.
- **Ignition temperature:** 400 °C (752 °F)
- **Decomposition temperature:** Not determined.
- **Auto igniting:** Product is not self-igniting.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:**
  - Lower:** Not determined.
  - Upper:** Not determined.
- **Vapor pressure:** Not applicable.
- **Density @ 20 °C (68 °F):** 3.707 g/cm<sup>3</sup> (30.935 lbs/gal)
- **Relative density:** Not determined.
- **Vapor density:** Not applicable.
- **Evaporation rate:** Not applicable.

(Contd. on page 4)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name:** nACo®, TiXCo®

· **Solubility in / Miscibility with:**

**Water:** Insoluble.

· **Partition coefficient (n-octanol/water):** Not determined.

· **Viscosity:**

**Dynamic:** Not applicable.

**Kinematic:** Not applicable.

· **Solvent content:**

**Organic solvents:** 0.0 %

**Solids content:** 100.0 %

· **Other information:** No further relevant information available.

### 10 Stability and Reactivity

· **Reactivity:** No further relevant information available.

· **Chemical stability:** Stable under normal conditions.

· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

· **Possibility of hazardous reactions:** No dangerous reactions known.

· **Conditions to avoid:** No further relevant information available.

· **Incompatible materials:** Strong oxidizing agents.

· **Hazardous decomposition products:**

- Nitrogen oxides
- Metal oxide fumes

### \* 11 Toxicological Information

· **Information on toxicological effects:**

· **Acute toxicity:**

· **Primary irritant effect:**

· **On the skin:** No irritating effect.

· **On the eye:** No irritating effect.

· **Additional toxicological information:**

The product is not subject to classification according to internally approved calculation methods for preparations.

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

· **Carcinogenic categories:**

· **IARC (International Agency for Research on Cancer):**

None of the ingredients are listed.

· **NTP (National Toxicology Program):**

None of the ingredients are listed.

· **OSHA-Ca (Occupational Safety & Health Administration):**

None of the ingredients are listed.

### 12 Ecological Information

· **Toxicity:**

· **Aquatic toxicity:** No further relevant information available.

· **Persistence and degradability:** No further relevant information available.

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## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: nACo®, TiXCo®**

- **Behavior in environmental systems:**
- **Bioaccumulative potential:** No further relevant information available.
- **Mobility in soil:** No further relevant information available.
- **Additional ecological information:**
- **General notes:**  
Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.
- **Results of PBT and vPvB assessment:**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects:** No further relevant information available.

### 13 Disposal Considerations

- **Waste treatment methods:**
- **Recommendation:**  
Smaller quantities can be disposed of with household waste.  
Observe all federal, state and local environmental regulations when disposing of this material.
- **Uncleaned packagings**
- **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport Information

- **UN-Number:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **UN proper shipping name:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **Transport hazard class(es):**
- **DOT, ADR, ADN, IMDG, IATA**
- **Class:** Non-Regulated Material
- **Packing group:**
- **DOT, ADR, IMDG, IATA** Non-Regulated Material
- **Environmental hazards:** Not applicable.
- **Special precautions for user:** Not applicable.
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.
- **UN "Model Regulation":** Non-Regulated Material

### 15 Regulatory Information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture:**
- **SARA (Superfund Amendments and Reauthorization):**

<b>Section 355 (extremely hazardous substances):</b>	None of the ingredients are listed.
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<b>Section 313 (Specific toxic chemical listings):</b>	7429-90-5 Aluminium
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<b>TSCA (Toxic Substances Control Act):</b>	All ingredients are listed or exempt from listing.
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(Contd. on page 6)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: nACo®, TiXCo®**

· **California Proposition 65:**

· <b>Chemicals known to cause cancer:</b>
None of the ingredients are listed.

· <b>Chemicals known to cause reproductive toxicity for females:</b>
None of the ingredients are listed.

· <b>Chemicals known to cause reproductive toxicity for males:</b>
None of the ingredients are listed.

· <b>Chemicals known to cause developmental toxicity:</b>
None of the ingredients are listed.

· <b>New Jersey Right-to-Know List:</b>
7429-90-5 Aluminium

· <b>New Jersey Special Hazardous Substance List:</b>	
7429-90-5 Aluminium	F3, R1

· <b>Pennsylvania Right-to-Know List:</b>
None of the ingredients are listed.

· <b>Pennsylvania Special Hazardous Substance List:</b>	
7429-90-5 Aluminium	E

· **Carcinogenic categories:**

· <b>EPA (Environmental Protection Agency):</b>
None of the ingredients are listed.

· <b>TLV (Threshold Limit Value established by ACGIH):</b>	
7429-90-5 Aluminium	A4

· <b>NIOSH-Ca (National Institute for Occupational Safety and Health):</b>
None of the ingredients are listed.

- **GHS label elements:** Non-Regulated Material
- **Hazard pictograms:** Non-Regulated Material
- **Signal word:** Non-Regulated Material
- **Hazard statements:** Non-Regulated Material

· <b>National regulations:</b>
The product is subject to be classified according with the latest version of the regulations on hazardous substances.

- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

**16 Other Information**

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

- **Date of preparation / last revision:** 04/06/2016 / 3

· **Abbreviations and acronyms:**

ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road  
 ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways  
 IMDG: International Maritime Code for Dangerous Goods  
 DOT: US Department of Transportation  
 IATA: International Air Transport Association  
 ACGIH: American Conference of Governmental Industrial Hygienists

## Safety Data Sheet (SDS)

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Reviewed on 04/06/2016

**Trade name: nACo®, TiXCo®**

EINECS: European Inventory of Existing Commercial Chemical Substances  
ELINCS: European List of Notified Chemical Substances  
CAS: Chemical Abstracts Service (division of the American Chemical Society)  
NFPA: National Fire Protection Association (USA)  
HMIS: Hazardous Materials Identification System (USA)  
LC50: Lethal concentration, 50 percent  
LD50: Lethal dose, 50 percent  
PBT: Persistent, Bioaccumulative and Toxic  
vPvB: very Persistent and very Bioaccumulative  
NIOSH: National Institute for Occupational Safety  
OSHA: Occupational Safety & Health  
TLV: Threshold Limit Value  
PEL: Permissible Exposure Limit  
REL: Recommended Exposure Limit  
BEI: Biological Exposure Limit  
Flam. Sol. 2: Flammable solids, Hazard Category 2

**\* Data compared to the previous version altered.**

SDS created by MSDS Authoring Services [www.msdsauthoring.com](http://www.msdsauthoring.com) +1-877-204-9106

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

### 1 Identification

· **Product Identifier**

· **Trade name:** nACoX®

· **Relevant identified uses of the substance or mixture and uses advised against:**

· **Product Description**

This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.

· **Details of the Supplier of the Safety Data Sheet:**

· **Manufacturer/Supplier:**

PLATIT, Inc.  
 1840 Industrial Drive, Suite 220  
 Libertyville, IL 60048-9466  
 PHONE: (847) 680-5270 (For product information)  
 FAX: (847) 680-5271  
 EMAIL: usa@platit.com

· **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

### 2 Hazard(s) Identification

· **Classification of the substance or mixture:**

The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.

· **Label elements:**

· **GHS label elements:** Non-Regulated Material

· **Hazard pictograms:** Non-Regulated Material

· **Signal word:** Non-Regulated Material

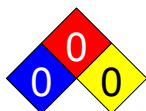
· **Hazard statements:** Non-Regulated Material

· **Unknown acute toxicity:**

55.9 % of the mixture consists of component(s) of unknown toxicity.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 0  
 Fire = 0  
 Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



HEALTH 0 Health = 0  
 FIRE 0 Fire = 0  
 REACTIVITY 0 Reactivity = 0

· **Hazard(s) not otherwise classified (HNOC):** None known

### 3 Composition/Information on Ingredients

· **Chemical characterization: Mixtures**

· **Description:** Mixture of substances listed below with non-hazardous additions.

· **Dangerous Components:**

CAS: 7727-37-9	Nitrogen	25-50%
RTECS: QW 9700000	⚠ Press. Gas, H280; Simple Asphyxiant	

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## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

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**Trade name: nACoX®**

CAS: 7440-32-6 RTECS: XR 1700000	Titanium ⚠ Skin Sens. 1, H317; Eye Irrit. 2B, H320	15-35%
CAS: 7429-90-5 RTECS: BD 0330000	Aluminium ⚠ Flam. Sol. 2, H228	15-35%
CAS: 7440-47-3 RTECS: GB 4200000	Chromium ⚠ Acute Tox. 4, H302; Acute Tox. 4, H312; Skin Irrit. 2, H315; Eye Irrit. 2B, H320	15-35%
CAS: 7440-21-3	Silicon ⚠ Flam. Sol. 2, H228; ⚠ Acute Tox. 4, H302; Eye Irrit. 2B, H320	5-10%

· **Additional information:** nACoX® coating accounts for less than 1% of complete part or tool.

### \* 4 First-Aid Measures

· **Description of first aid measures:**

· **General information:**

Symptoms of poisoning may occur after exposure to dust, fumes or particulates; seek medical attention if feeling unwell.

No special measures required.

· **After inhalation:**

Supply fresh air. If required, provide artificial respiration. Consult doctor if symptoms persist.

In case of unconsciousness place patient stably in side position for transportation.

· **After skin contact:** Generally the product does not irritate the skin.

· **After eye contact:** Rinse opened eye for several minutes under running water.

· **After swallowing:** If swallowed and symptoms occur, consult a doctor.

· **Information for doctor:**

· **Most important symptoms and effects, both acute and delayed:** No further relevant information available.

· **Indication of any immediate medical attention and special treatment needed:**

No further relevant information available.

### \* 5 Fire-Fighting Measures

· **Extinguishing media:**

· **Suitable extinguishing agents:**

CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

· **Special hazards arising from the substance or mixture:**

Amorphous or crystalline silicon both react exothermically when heated with alkali-metal carbonates attaining incandescence and evolving carbon monoxide.

Material in powder form, capable of creating a dust explosion. Mixture of silicon, aluminum, and lead oxide explodes when heated.

Moderate fire hazard when it is in the form of a dust (powder) and burns rapidly when heated in flame.

Chromium is attacked vigorously by fused potassium chlorate producing vivid incandescence. Pyrophoric chromium unites with nitric oxide with incandescence. Incandescent reaction with nitrogen oxide or sulfur dioxide.

Special Remarks on Explosion Hazards:

Powdered Chromium metal +fused ammonium nitrate may react violently or explosively. Powdered Chromium will explode spontaneously in air.

· **Advice for firefighters:**

· **Protective equipment:**

Mouth respiratory protective device.

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## Safety Data Sheet (SDS)

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**Trade name: nACoX®**

As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

**\* 6 Accidental Release Measures**

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**  
 Dispose contaminated material as waste according to section 13.  
 Ensure adequate ventilation.  
 Dispose of the collected material according to regulations.
- **Reference to other sections:**  
 See Section 7 for information on safe handling.  
 See Section 8 for information on personal protection equipment.  
 See Section 13 for disposal information.

**\* 7 Handling and Storage**

- **Handling**
- **Precautions for safe handling:**  
 No special measures required.  
 Avoid creating and breathing dust/fume/gas/mist/vapors/spray.  
 Ensure good ventilation/exhaustion at the workplace.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Keep receptacle tightly sealed.
- **Specific end use(s):** No further relevant information available.

**\* 8 Exposure Controls/Personal Protection**

- **Additional information about design of technical systems:** No further data; see section 7.
- **Control parameters:**
- **Components with occupational exposure limits:**  
 The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.  
 At this time, the remaining constituent has no known exposure limits.

<b>7727-37-9 Nitrogen</b>	
TLV	withdrawn TLV, see App. F; simple asphyxiant
<b>7429-90-5 Aluminium</b>	
PEL	Long-term value: 15* 5** mg/m <sup>3</sup> *Total dust; ** Respirable fraction
REL	Long-term value: 10* 5** mg/m <sup>3</sup> as Al*Total dust**Respirable/pyro powd./welding f.
TLV	Long-term value: 1* mg/m <sup>3</sup> as Al; *as respirable fraction

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## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

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**Trade name: nACoX®**

<b>7440-47-3 Chromium</b>	
PEL	Long-term value: 1* 0.5** mg/m <sup>3</sup> *metal;**inorganic compds., as Cr
REL	Long-term value: 0.5* mg/m <sup>3</sup> *metal+inorg.compds.as Cr;See Pocket Guide App. C
TLV	Long-term value: 0.5 mg/m <sup>3</sup>
<b>7440-21-3 Silicon</b>	
PEL	Long-term value: 15* 5** mg/m <sup>3</sup> *total dust **respirable fraction
REL	Long-term value: 10* 5** mg/m <sup>3</sup> *total dust **respirable fraction
TLV	TLV withdrawn

- **Additional information:** The lists that were valid during the creation of this SDS were used as basis.
- **Exposure controls:**
- **Personal protective equipment:**
- **General protective and hygienic measures:** Keep away from foodstuffs, beverages and feed.
- **Breathing equipment:** Not required.
- **Protection of hands:** Not required.
- **Material of gloves:** Not required.
- **Penetration time of glove material:** Not applicable.
- **Eye protection:** Not required.

**\* 9 Physical and Chemical Properties**

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**
  - Form:** Solid
  - Color:** Black
- **Odor:** Odorless
- **Odor threshold:** Not determined.
- **pH-value:** Not applicable.
- **Change in condition**
  - Melting point/Melting range:** Not determined.
  - Boiling point/Boiling range:** Not determined.
- **Flash point:** None
- **Flammability (solid, gaseous):** Not determined.
- **Ignition temperature:** 400 °C (752 °F)
- **Decomposition temperature:** Not determined.
- **Auto igniting:** Product is not self-igniting.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:**
  - Lower:** Not determined.
  - Upper:** Not determined.
- **Vapor pressure:** Not applicable.

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Reviewed on 04/06/2016

**Trade name: nACoX®**

- **Density @ 20 °C (68 °F):** 2.88 g/cm<sup>3</sup> (24.034 lbs/gal)
- **Relative density:** Not determined.
- **Vapor density:** Not applicable.
- **Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with:**
- **Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
- **Dynamic:** Not applicable.
- **Kinematic:** Not applicable.
- **Solvent content:**
- **Organic solvents:** 0.0 %
- **Other information:** No further relevant information available.

### 10 Stability and Reactivity

- **Reactivity:** No further relevant information available.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No known hazardous reactions
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** Toxic chromium oxide fumes.

### \* 11 Toxicological Information

- **Information on toxicological effects:**
- **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

#### 7429-90-5 Aluminium

Oral	LD50	>2000 mg/kg (rat)
Inhalative	LC50/4 h	888 mg/l (rat)

#### 7440-21-3 Silicon

Oral	LD50	3160 mg/kg (rat)
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- **Primary irritant effect:**
- **On the skin:** No irritating effect.
- **On the eye:** No irritating effect.
- **Additional toxicological information:**  
 The product is not subject to classification according to internally approved calculation methods for preparations.  
 When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
- **Carcinogenic categories:**
- **IARC (International Agency for Research on Cancer):**

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## Safety Data Sheet (SDS)

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Issue date 04/06/2016

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**Trade name: nACoX®**

- Group 1 - Carcinogenic to humans
- Group 2A - Probably carcinogenic to humans
- Group 2B - Possibly carcinogenic to humans
- Group 3 - Not classifiable as to its carcinogenicity to humans
- Group 4 - Probably not carcinogenic to humans

7440-47-3	Chromium	3
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· **NTP (National Toxicology Program):**  
None of the ingredients are listed.

· **OSHA-Ca (Occupational Safety & Health Administration):**  
None of the ingredients are listed.

### 12 Ecological Information

· **Toxicity:**

· **Aquatic toxicity:**

<b>7440-47-3 Chromium</b>	
EC50	0.07 mg/l (Water flea)

- **Persistence and degradability:** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential:** No further relevant information available.
- **Mobility in soil:** No further relevant information available.
- **Additional ecological information:**
- **General notes:**  
Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.
- **Results of PBT and vPvB assessment:**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects:** No further relevant information available.

### 13 Disposal Considerations

- **Waste treatment methods:**
- **Recommendation:**  
Smaller quantities can be disposed of with household waste.  
Observe all federal, state and local environmental regulations when disposing of this material.
- **Uncleaned packagings**
- **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport Information

- **UN-Number:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **UN proper shipping name:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **Transport hazard class(es):**
- **DOT, ADR, ADN, IMDG, IATA**
- **Class:** Non-Regulated Material
- **Packing group:**
- **DOT, ADR, IMDG, IATA** Non-Regulated Material
- **Environmental hazards:** Not applicable.

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: nACoX®**

- **Special precautions for user:** Not applicable.
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.
- **UN "Model Regulation":** Non-Regulated Material

**\* 15 Regulatory Information**

- **Safety, health and environmental regulations/legislation specific for the substance or mixture:**
- **SARA (Superfund Amendments and Reauthorization):**

<b>· Section 355 (extremely hazardous substances):</b>	
None of the ingredients are listed.	

<b>· Section 313 (Specific toxic chemical listings):</b>	
7429-90-5	Aluminium
7440-47-3	Chromium

<b>· TSCA (Toxic Substances Control Act):</b>	
7727-37-9	Nitrogen
7440-32-6	Titanium
7429-90-5	Aluminium
7440-47-3	Chromium
7440-21-3	Silicon

<b>· California Proposition 65:</b>	
<b>· Chemicals known to cause cancer:</b>	
None of the ingredients are listed.	

<b>· Chemicals known to cause reproductive toxicity for females:</b>	
None of the ingredients are listed.	

<b>· Chemicals known to cause reproductive toxicity for males:</b>	
None of the ingredients are listed.	

<b>· Chemicals known to cause developmental toxicity:</b>	
None of the ingredients are listed.	

<b>· New Jersey Right-to-Know List:</b>	
All ingredients are listed.	

<b>· New Jersey Special Hazardous Substance List:</b>		
7440-32-6	Titanium	F3, R1
7429-90-5	Aluminium	F3, R1
7440-47-3	Chromium	F3
7440-21-3	Silicon	F3

<b>· Pennsylvania Right-to-Know List:</b>		
7727-37-9	Nitrogen	
7429-90-5	Aluminium	
7440-47-3	Chromium	
7440-21-3	Silicon	

<b>· Pennsylvania Special Hazardous Substance List:</b>		
7429-90-5	Aluminium	E
7440-47-3	Chromium	ES

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

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**Trade name: nACoX®**

· **Carcinogenic categories:**

· <b>EPA (Environmental Protection Agency):</b>		
7440-47-3	Chromium	D

· **TLV (Threshold Limit Value established by ACGIH):**

7429-90-5	Aluminium	A4
7440-47-3	Chromium	A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health):**

None of the ingredients are listed.

- **GHS label elements** Non-Regulated Material
- **Hazard pictograms:** Non-Regulated Material
- **Signal word:** Non-Regulated Material
- **Hazard statements:** Non-Regulated Material

· **National regulations:**

The product is subject to be classified according with the latest version of the regulations on hazardous substances.

- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

### 16 Other Information

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

- **Date of preparation / last revision:** 04/06/2016 / 4

· **Abbreviations and acronyms:**

- ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road
- ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- ACGIH: American Conference of Governmental Industrial Hygienists
- EINECS: European Inventory of Existing Commercial Chemical Substances
- ELINCS: European List of Notified Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- NFPA: National Fire Protection Association (USA)
- HMIS: Hazardous Materials Identification System (USA)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- PBT: Persistent, Bioaccumulative and Toxic
- vPvB: very Persistent and very Bioaccumulative
- NIOSH: National Institute for Occupational Safety
- OSHA: Occupational Safety & Health
- TLV: Threshold Limit Value
- PEL: Permissible Exposure Limit
- REL: Recommended Exposure Limit
- BEI: Biological Exposure Limit
- Press. Gas: Gases under pressure: Compressed gas
- Flam. Sol. 2: Flammable solids, Hazard Category 2
- Acute Tox. 4: Acute toxicity, Hazard Category 4
- Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
- Eye Irrit. 2B: Serious eye damage/eye irritation, Hazard Category 2B
- Skin Sens. 1: Sensitisation - Skin, Hazard Category 1

- **\* Data compared to the previous version altered.**

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## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

### 1 Identification

· **Product Identifier**

· **Trade name:** nACRo®

· **Relevant identified uses of the substance or mixture and uses advised against:**

· **Product Description**

This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.

· **Details of the Supplier of the Safety Data Sheet:**

· **Manufacturer/Supplier:**

PLATIT, Inc.  
 1840 Industrial Drive, Suite 220  
 Libertyville, IL 60048-9466  
 PHONE: (847) 680-5270 (For product information)  
 FAX: (847) 680-5271  
 EMAIL: usa@platit.com

· **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

### 2 Hazard(s) Identification

· **Classification of the substance or mixture:**

The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.

· **Label elements:**

· **GHS label elements:** Non-Regulated Material

· **Hazard pictograms:** Non-Regulated Material

· **Signal word:** Non-Regulated Material

· **Hazard statements:** Non-Regulated Material

· **Unknown acute toxicity:**

7 % of the mixture consists of component(s) of unknown toxicity.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



· **HMIS-ratings (scale 0 - 4)**

HEALTH	1	Health = 1
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

· **Hazard(s) not otherwise classified (HNOC):** None known

### \* 3 Composition/Information on Ingredients

· **Non-hazardous components:**

12033-89-5	Silicon Nitride	5-10%
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· **Chemical characterization:** Mixtures

· **Description:** Mixture of substances listed below with non-hazardous additions.

(Contd. on page 2)



## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

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**Trade name: nACRo®**

· <b>Dangerous Components:</b>		
CAS: 7429-90-5 RTECS: BD 0330000	Aluminium ⚠ Flam. Sol. 2, H228	40-60%
CAS: 7789-02-8 RTECS: GB6300000	Chromium(III) nitrate nonahydrate ⚠ Ox. Liq. 2, H272; Ox. Sol. 2, H272; ⚠ STOT SE 2, H371; ⚠ Skin Corr. 1A, H314; Eye Dam. 1, H318; ⚠ Acute Tox. 4, H302	25-50%

· **Additional information:** nACRo® coating accounts for less than 1% of complete part or tool.

### 4 First-Aid Measures

- **Description of first aid measures:**
- **General information:** No special measures required.
- **After inhalation:** Not expected as a result of exposure to finished product.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Not expected as a result of exposure to finished product.
- **After swallowing:** Not anticipated under normal use.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**  
No further relevant information available.

### 5 Fire-Fighting Measures

- **Extinguishing media:**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Advice for firefighters:**
- **Protective equipment:**  
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

### 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**  
Dispose of the collected material according to regulations.
- **Reference to other sections:**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and Storage

- **Handling**
- **Precautions for safe handling:** No special measures required.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** Store in the original container.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.

(Contd. on page 3)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name:** nACRo®

- **Specific end use(s):** No further relevant information available.

### 8 Exposure Controls/Personal Protection

- **Additional information about design of technical systems:** No further data; see section 7.

· **Control parameters:**

· **Components with occupational exposure limits:**

#### 7429-90-5 Aluminium

PEL	Long-term value: 15*; 5** mg/m <sup>3</sup> *Total dust; ** Respirable fraction
REL	Long-term value: 10* 5** mg/m <sup>3</sup> as Al*Total dust**Respirable/pyro powd./welding f.
TLV	Long-term value: 1* mg/m <sup>3</sup> as Al; *as respirable fraction

#### 7789-02-8 Chromium(III) nitrate nonahydrate

TWA	Long-term value: 5
-----	--------------------

- **Additional information:** The lists that were valid during the creation of this SDS were used as basis.
- **Exposure controls:**
- **Personal protective equipment:**
- **General protective and hygienic measures:** No special measures required.
- **Breathing equipment:** Not required.
- **Protection of hands:** Not required.
- **Material of gloves:** Not required.
- **Penetration time of glove material:** Not applicable.
- **Eye protection:** Not required.

### 9 Physical and Chemical Properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

<b>Form:</b>	Solid
<b>Color:</b>	Grey
<b>Odor:</b>	Odorless
<b>Odor threshold:</b>	Not determined.

· **pH-value:** Not applicable.

· **Change in condition**

<b>Melting point/Melting range:</b>	Not determined.
<b>Boiling point/Boiling range:</b>	100 °C (212 °F)

· **Flash point:** None

· **Flammability (solid, gaseous):** Not determined.

· **Ignition temperature:** 400 °C (752 °F)

· **Decomposition temperature:** Not determined.

· **Auto igniting:** Product is not self-igniting.

· **Danger of explosion:** Product does not present an explosion hazard.

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## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: nACRo®**

- **Explosion limits:**
  - Lower:** Not determined.
  - Upper:** Not determined.
- **Vapor pressure:** Not applicable.
- **Density @ 20 °C (68 °F):** 2.408 g/cm<sup>3</sup> (20.095 lbs/gal)
- **Relative density:** Not determined.
- **Vapor density:** Not applicable.
- **Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with:**
  - Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - Dynamic:** Not applicable.
  - Kinematic:** Not applicable.
- **Solvent content:**
  - Organic solvents:** 0.0 %
  - Solids content:** 100.0 %
- **Other information:** No further relevant information available.

### 10 Stability and Reactivity

- **Reactivity:** No further relevant information available.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** Strong oxidizing agents.
- **Hazardous decomposition products:**
  - Nitrogen oxides
  - Metal oxide fumes

### 11 Toxicological Information

- **Information on toxicological effects:**
- **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

**7429-90-5 Aluminium**

Oral	LD50	>2000 mg/kg (rat)
Inhalative	LC50/4 h	888 mg/l (rat)

**7789-02-8 Chromium(III) nitrate nonahydrate**

Oral	LD50	3250 mg/kg (rat)
------	------	------------------

- **Primary irritant effect:**
- **On the skin:** No irritating effect.
- **On the eye:** No irritating effect.
- **Additional toxicological information:**

The product is not subject to classification according to internally approved calculation methods for preparations.

(Contd. on page 5)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: nACRo®**

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

· **Carcinogenic categories:**

· <b>IARC (International Agency for Research on Cancer):</b>
None of the ingredients are listed.
· <b>NTP (National Toxicology Program):</b>
None of the ingredients are listed.
· <b>OSHA-Ca (Occupational Safety &amp; Health Administration):</b>
None of the ingredients are listed.

### 12 Ecological Information

- **Toxicity:**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability:** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential:** No further relevant information available.
- **Mobility in soil:** No further relevant information available.
- **Additional ecological information:**
- **General notes:**  
Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.
- **Results of PBT and vPvB assessment:**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects:** No further relevant information available.

### 13 Disposal Considerations

- **Waste treatment methods:**
- **Recommendation:**  
Smaller quantities can be disposed of with household waste.  
Observe all federal, state and local environmental regulations when disposing of this material.
- **Uncleaned packagings**
- **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport Information

- **UN-Number:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **UN proper shipping name:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **Transport hazard class(es):**
- **DOT, ADR, ADN, IMDG, IATA**
- **Class:** Non-Regulated Material
- **Packing group:**
- **DOT, ADR, IMDG, IATA** Non-Regulated Material
- **Environmental hazards:** Not applicable.
- **Special precautions for user:** Not applicable.
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: nACRo®**

· **UN "Model Regulation":** Non-Regulated Material

### 15 Regulatory Information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture:**  
 · **SARA (Superfund Amendments and Reauthorization):**

· **Section 355 (extremely hazardous substances):**

None of the ingredients are listed.

· **Section 313 (Specific toxic chemical listings):**

7429-90-5 Aluminium

7789-02-8 Chromium(III) nitrate nonahydrate

· **TSCA (Toxic Substances Control Act):**

7429-90-5 Aluminium

12033-89-5 Silicon Nitride

· **California Proposition 65:**

· **Chemicals known to cause cancer:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients are listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients are listed.

· **New Jersey Right-to-Know List:**

7429-90-5 Aluminium

· **New Jersey Special Hazardous Substance List:**

7429-90-5 Aluminium

F3, R1

· **Pennsylvania Right-to-Know List:**

None of the ingredients are listed.

· **Pennsylvania Special Hazardous Substance List:**

7429-90-5 Aluminium

E

· **Carcinogenic categories:**

· **EPA (Environmental Protection Agency):**

None of the ingredients are listed.

· **TLV (Threshold Limit Value established by ACGIH):**

7429-90-5 Aluminium

A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health):**

None of the ingredients are listed.

· **GHS label elements** Non-Regulated Material

· **Hazard pictograms:** Non-Regulated Material

· **Signal word:** Non-Regulated Material

· **Hazard statements:** Non-Regulated Material

(Contd. on page 7)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: nACRo®**
**· National regulations:**

The product is subject to be classified according with the latest version of the regulations on hazardous substances.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

### 16 Other Information

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

· **Date of preparation / last revision:** 04/06/2016 / 2

· **Abbreviations and acronyms:**

ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road  
 ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways  
 IMDG: International Maritime Code for Dangerous Goods  
 DOT: US Department of Transportation  
 IATA: International Air Transport Association  
 ACGIH: American Conference of Governmental Industrial Hygienists  
 EINECS: European Inventory of Existing Commercial Chemical Substances  
 ELINCS: European List of Notified Chemical Substances  
 CAS: Chemical Abstracts Service (division of the American Chemical Society)  
 NFPA: National Fire Protection Association (USA)  
 HMIS: Hazardous Materials Identification System (USA)  
 LC50: Lethal concentration, 50 percent  
 LD50: Lethal dose, 50 percent  
 PBT: Persistent, Bioaccumulative and Toxic  
 vPvB: very Persistent and very Bioaccumulative  
 NIOSH: National Institute for Occupational Safety  
 OSHA: Occupational Safety & Health  
 TLV: Threshold Limit Value  
 PEL: Permissible Exposure Limit  
 REL: Recommended Exposure Limit  
 BEI: Biological Exposure Limit  
 Flam. Sol. 2: Flammable solids, Hazard Category 2  
 Ox. Liq. 2: Oxidising Liquids, Hazard Category 2  
 Ox. Sol. 2: Oxidising Solids, Hazard Category 2  
 Acute Tox. 4: Acute toxicity, Hazard Category 4  
 Skin Corr. 1A: Skin corrosion/irritation, Hazard Category 1A  
 Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1  
 STOT SE 2: Specific target organ toxicity - Single exposure, Hazard Category 2

· **\* Data compared to the previous version altered.**

SDS created by MSDS Authoring Services    www.msdsauthoring.com    +1-877-204-9106

**Safety Data Sheet**  
according to Regulation (EC) No. 1907/2006 (REACH)

**oerlikon**  
balzers

**Trade name :** BALINIT® ALCRONA / BALINIT® ALCRONA PRO /  
BALINIT® ALCRONA PRO ADVANCED  
**Version :** 10.01.2012 8.0.0  
**Revision :** 10.01.2012

## 1. Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifier

BALINIT® ALCRONA / BALINIT® ALCRONA PRO /  
BALINIT® ALCRONA PRO ADVANCED

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

**Relevant identified uses**

coating

### 1.3 Details of the supplier of the safety data sheet

#### Supplier

OC Oerlikon Balzers AG  
Balzers Technology and Service Centre

#### Street :

Iramali 18

#### Postal code/city :

9496 Balzers

#### Telephone :

00423 388 75 00

#### Telefax :

00423 388 54 11

#### Information contact :

info.balzers@oerlikon.com  
www.oerlikon.com/balzers

### 1.4 Emergency Telephone Number

Schweizerisches Toxikologisches Informationszentrum +41 44 251 51 51

## 2. Hazards identification

### 2.1 Classification of the substance or mixture

**Classification according to Directive 67/548/EEC or 1999/45/EC**

None

### 2.2 Label elements

**Labelling (67/548/EEC or 1999/45/EC)**

**Special provisions concerning the labelling of certain mixtures**

101 Safety data sheet available for professional user on request.

### 2.3 Other hazards

None

## 3. Composition/ Information on ingredients

### 3.2 Mixtures

#### Hazardous ingredients

ALUMINIUM NITRIDE ; EC No : 246-140-8; CAS No. : 24304-00-5

Weight fraction : < 5 %

Classification 67/548/EEC : Xi ; R37

Classification 1271/2008 [CLP] : STOT SE 3 ; H335

#### Additional information

Full text of R-, H- and EUH-phrases: see section 16.

## 4. First-aid measures

### 4.1 Description of first aid measures

**After inhalation**

**Safety Data Sheet**  
**according to Regulation (EC) No. 1907/2006 (REACH)**

**oerlikon**  
balzers

**Trade name :** BALINIT® ALCRONA / BALINIT® ALCRONA PRO /  
BALINIT® ALCRONA PRO ADVANCED  
**Version :** 10.01.2012 8.0.0  
**Revision :** 10.01.2012

No particular measures required.

**In case of skin contact**

Water and soap.

**After eye contact**

After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an ophthalmologist immediately. In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

**After ingestion**

Do not induce vomiting - call a physician.

**4.2 Most important symptoms and effects, both acute and delayed**

No information available.

**4.3 Indication of any immediate medical attention and special treatment needed**

None

**5. Firefighting measures**

**5.1 Extinguishing media**

**Suitable extinguishing media**

Foam, CO<sub>2</sub>, powder extinguisher.

**Unsuitable extinguishing media**

None known.

**5.2 Special hazards arising from the substance or mixture**

None known.

**5.3 Advice for firefighters**

None

**5.4 Additional information**

None.

**6. Accidental release measures**

**6.1 Personal precautions, protective equipment and emergency procedures**

Take the precautions customary when handling chemicals.

**6.2 Environmental precautions**

Do not allow to enter into surface water or drains.

**6.3 Methods and material for containment and cleaning up**

None

**6.4 Reference to other sections**

None

**7. Handling and storage**

**7.1 Precautions for safe handling**

If handled uncovered, arrangements with local exhaust ventilation have to be used.

**Protective measures**

**Fire prevent measures**

No anti-explosion measures necessary.

**7.2 Conditions for safe storage, including any incompatibilities**

**Hints on storage assembly**



# Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH)

**oerlikon**  
balzers

**Trade name :** BALINIT® ALCRONA / BALINIT® ALCRONA PRO /  
BALINIT® ALCRONA PRO ADVANCED  
**Version :** 10.01.2012 8.0.0  
**Revision :** 10.01.2012

Keep away from oxidizing agents, from strongly alkaline and strongly acid materials.

## Further information on storage conditions

Containers should be kept dry and sealed.

### 7.3 Specific end uses

None

## 8. Exposure controls / Personal protection

### 8.1 Control parameters

None

### 8.2 Exposure controls

#### Personal protective equipment

##### Eye / face protection

Eye glasses

##### Skin protection

###### Body protection

**Suitable protective clothing :** No particular measures required.

##### Respiratory protection

Fresh-air tube device (DIN EN 138)

#### General health and safety measures

Keep away from food, drink and animal feeding stuff

## 9. Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### Appearance

**Physical state :** solid

**Colour :** blue-grey

#### Odour

odourless

#### Safety relevant basis data

<b>Boiling temperature / boiling range :</b>	( 1013 hPa )	No data available
<b>Decomposition temperature :</b>	>	1100 °C
<b>Flash point :</b>		not applicable
<b>Density :</b>	( 20 °C )	5.9 g/cm <sup>3</sup>
<b>Water solubility :</b>	( 20 °C )	insoluble

### 9.2 Other information

Friction coefficient against steel: 0.35 Microhardness (HV 0.05): 3200

## 10. Stability and reactivity

### 10.1 Reactivity

No information available.

### 10.2 Chemical stability

No information available.

### 10.3 Possibility of hazardous reactions

No information available.

**Safety Data Sheet**  
according to Regulation (EC) No. 1907/2006 (REACH)

**oerlikon**  
balzers

**Trade name :** BALINIT® ALCRONA / BALINIT® ALCRONA PRO /  
BALINIT® ALCRONA PRO ADVANCED  
**Version :** 10.01.2012 8.0.0  
**Revision :** 10.01.2012

**10.4 Conditions to avoid**

Stable under recommended storage and handling conditions(See section 7).

**10.5 Incompatible materials**

strong acid and basic conditions, metals

**10.6 Hazardous decomposition products**

No information available.

**11. Toxicological information**

**11.1 Information on toxicological effects**

**Irritant and corrosive effects**

**Primary irritation to the skin**

No known toxic effects on humans.

**12. Ecological information**

**12.1 Toxicity**

No information available.

**12.2 Persistence and degradability**

No information available.

**12.3 Bioaccumulative potential**

No information available.

**12.4 Mobility in soil**

No information available.

**12.5 Results of PBT and vPvB assessment**

No information available.

**12.6 Other adverse effects**

No information available.

**12.7 Further ecological information**

None

**12.8 Overall evaluation**

Do not empty the product into drains,do not store on public depositories disposal: in accordance with local official regulations.

**13. Disposal considerations**

Recycle according to official regulations.

**13.1 Waste treatment methods**

**Product/Packaging disposal**

**Waste codes / waste designations according to EWC / AVV**

**Waste code product**

Waste code (91/689/EEC) : 06 04 05\*

**14. Transport information**

**14.1 UN number**

No dangerous good in sense of this transport regulation.

**14.2 UN proper shipping name**

# Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH)

**oerlikon**  
balzers

**Trade name :** BALINIT® ALCRONA / BALINIT® ALCRONA PRO /  
BALINIT® ALCRONA PRO ADVANCED  
**Version :** 10.01.2012 8.0.0  
**Revision :** 10.01.2012

No dangerous good in sense of this transport regulation.

#### 14.3 Transport hazard class(es)

No dangerous good in sense of this transport regulation.

#### 14.4 Packing group

No dangerous good in sense of this transport regulation.

#### 14.5 Environmental hazards

No dangerous good in sense of this transport regulation.

#### 14.6 Special precautions for user

None

### 15. Regulatory information

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

None

#### 15.2 Chemical safety assessment

No information available.

### 16. Other information

The user is responsible for the observance of all required statutory provisions.

#### 16.1 Indication of changes

None

#### 16.2 Abbreviations and acronyms

None

#### 16.3 Key literature references and sources for data

None

#### 16.4 Classification for mixtures and used evaluation method according to regulation (EC) 1207/2008 [CLP]

##### Classification according to Regulation (EC) No. 1272/2008 [CLP]

There are no data available on the product itself.

None

#### 16.5 Relevant R-, H- and EUH-phrases (Number and full text)

H335 May cause respiratory irritation.

37 Irritating to respiratory system.

#### 16.6 Training advice

None

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

# Material Safety Data Sheet

Surface Solutions Incorporated

Prepared by: Clark Bergman

12 November 2009

## Section 1. Product & Company Identification

Name: Alpha™ Coating  
Manufacturer: Surface Solutions Incorporated  
7995 Ranchers Road N.E.  
Fridley, MN 55432-2507  
763-785-9436

## Section 2. Composition

Ingredients: Titanium nitride, ≈50%  
Zirconium nitride, ≈50%  
Molecular Formula: Multilayer of TiN & ZrN  
Chemical Family: Metal Nitride  
CAS: TiN: 25583-20-4  
ZrN: 25658-42-8

## Section 3. Hazards Identification

Solid Form: Non-toxic  
Dust Form: TiN: TLV = 10 mg/m<sup>3</sup> (as TiO<sub>2</sub>)  
OSHA/PEL = 15 mg/m<sup>3</sup> (as TiO<sub>2</sub>)  
ZrN: TLV = 5 mg/m<sup>3</sup> (as Zr)  
OSHA/PEL = 5 mg/m<sup>3</sup> (as Zr)

## Section 4. First Aid Measures

Not applicable.

## Section 5. Fire Fighting Measures

Not applicable.

## Section 6. Accidental Release Measures

Not applicable.

## Section 7. Handling & Storage

No restrictions.

# Material Safety Data Sheet

Surface Solutions Incorporated

Prepared by: Clark Bergman

12 November 2009

**Section 8. Exposure Controls & Personal Protection**

Not applicable.

**Section 9. Physical & Chemical Properties**

Color: Pale Gold  
Thickness: 0.01 to 10  $\mu\text{m}$  (typically 2 to 5  $\mu\text{m}$ )  
Molecular weight; TiN: 62  
ZrN: 105  
Specific Gravity:  $\approx 6.4 \text{ g/cm}^3$   
Melting Point: 2930°C  
Odor: None  
Soluble in H<sub>2</sub>O: No

**Section 10. Stability & Reactivity**

Stability: Stable  
Oxidation: TiN: Occurs above  $\approx 450^\circ\text{C}$   
ZrN: Occurs above  $\approx 550^\circ\text{C}$

**Section 11. Toxicological Information**

Biocompatible.

**Section 12. Ecological Information**

No known problems.

**Section 13. Disposal Considerations**

Same as the article on which the coating resides

**Section 14. Transport Information**

No restrictions.

**Section 15. Regulatory Information**

None.

**Section 16. Other Information**

None.



# Multi-Arc Inc.

## Material Safety Data Sheet

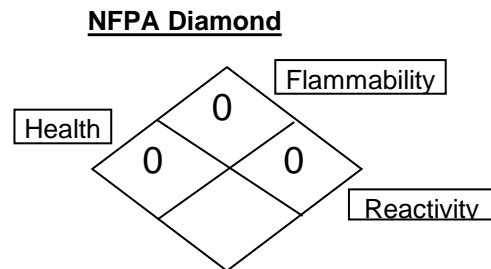


**Product:** TETRABOND<sup>(R)</sup>  
**MSDS No:** MSDS-010-A

### Section I - Identification

**Common Name:** TETRABOND(R)  
**Synonyms:** TETRABOND(R)  
**CAS Name:** None  
**CAS #:** None  
**Chemical Family:** Inorganic Crystals

**Formula:** C<sub>x</sub>



### Section II - Hazardous Ingredients Information

Hazardous Components	OSHA PEL-TWA	ACGIH TLV-TWA	Other Limits Recommended
None	None	None	None

This product exhibits none of the 9 physical hazards that define an "OSHA Hazardous Chemical" (29 CFR 1910.1200c). TETRABOND<sup>(R)</sup> is not listed on OSHA's Toxic and Hazardous Substances (29 CFR 1910, subpart Z) nor is it listed as having a Threshold Limit Value (TLV) by the American Conference of Government Industrial Hygienists. TETRABOND<sup>(R)</sup> is considered to be non toxic and is FDA allowed for use on medical instruments and devices.

### Section III - Physical/Chemical Characteristics

<b>Boiling Point:</b> (760 mm Hg)	N/A	<b>Specific Gravity:</b>	N/A
<b>Vapor Pressure:</b> (25C)	N/A	<b>Evaporation Rate:</b>	N/A
<b>Vapor Density:</b> (Air=1)	N/A	<b>Freezing Rate:</b>	N/A
<b>Solubility in Water:</b>	N/A		

**Appearance and Odor:** dark gray, Odorless

## Section IV - Fire and Explosion Data

<b>Flash Point:</b>	None	<b>Extinguishing Media:</b>	N/A
<b>Flammable Limits (In air, % by volume):</b>	None		
<b>Special Fire Fighting Procedures:</b>	None	<b>Unusual Fire Fighting Procedures:</b>	None

## Section V - Reactivity Data

<b>Stability:</b>	Stable	<b>Conditions to Avoid:</b>	Stable under accepted use conditions
<b>Hazardous Polymerization:</b>	Does Not Occur	<b>Conditions to Avoid:</b>	None
<b>Incompatibility (Materials to Avoid):</b>			Strong oxidizers, acids with strong oxidation potentials
<b>Hazardous Decomposition or By-Products:</b>			None

## Section VI - Health Hazard Data

Routes of Entry                      **Inhalation:** No                      **Skin:** No                      **Ingestion:** No

### Acute Health Hazards

<b>Inhalation:</b>	Not a Known Hazard
<b>Skin Contact:</b>	Not a Known Hazard
<b>Skin Absorption:</b>	Not a Known Hazard
<b>Eye Contact</b>	Not a Known Hazard
<b>Ingestion:</b>	Not a Known Hazard

### Chronic Health Hazards

<b>Toxicity</b>	Not a Known Hazard
<b>Carcinogenicity</b>	Not a known or listed carcinogen

### Emergency First Aid Procedures

<b>Inhalation:</b>	N/A
<b>Eyes:</b>	N/A
<b>Ingestion:</b>	N/A
<b>Skin:</b>	N/A

## **Section VII - Precautions for Safe Handling and Use**

**Steps To Be Taken In Case Of Release Or Spills**

N/A

**Waste Disposal Method**

Not a hazardous or controlled waste. Follow applicable regulations for the disposal of the coated substrate, tool, object or part.

**Precautions To Be Taken In Handling and Storage**

No special precautions for this product. Follow precautions appropriate for coated substrate, tool, object or part.

## **Section VIII - Control Measures**

**Ventilation:**

Not required for this product. Use measures appropriate for the use of the coated substrate, tool, object or part.

**Protective Gloves:**

Not required for this product. Use measures appropriate for the use of the coated substrate, tool, object or part.

**Eye Protection:**

Not required for this product. Use measures appropriate for the use of the coated substrate, tool, object or part.

**Respiratory Protection**

Not required for this product. Use measures appropriate for the use of the coated substrate, tool, object or part.

**Other Protective Clothing/Equipment:**

Not required for this product. Use measures appropriate for the use of the coated substrate, tool, object or part.

**Work / Hygienic Practices:**

Not required for this product. Use measures appropriate for the use of the coated substrate, tool, object or part.

## **Section IX - Regulatory Information**

Product not listed as a SARA Title III, Section 302 Extremely Hazardous Material (40 CFR Part 355)

Product not listed as a SARA Title III, Section 313 Toxic Chemical (40 CFR Part 372.65)

Product not listed as a CERCLA Hazardous Substance (40 CFR Part 302.4)

## **Section X - Other Information**

Under normal circumstances of application and use, the technical requirements of the production process for the product noted above dictate that it can not exist in any state that is independent of the substrate, part, tool or object to which it is applied. This product as created is an end product in its final use form and is not subsequently further processed or modified. Consequently, an MSDS is not typically required for this product. This MSDS has been prepared on a voluntary basis for information purposes only and does not in any way, shape or form acknowledge a requirement to do so or that the product above is a hazardous material requiring the creation of an MSDS.

This information relates to the specific product designated and may not be valid for such products used in combination with any other materials or process. Such information is to the best of Multi-Arc's knowledge and belief and is accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. Multi-Arc does not accept liability for any loss or damage that may occur from the use of this product either singly or in combination with other substances.



## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

### 1 Identification

· **Product Identifier**

· **Trade name: TiAICN**

· **Relevant identified uses of the substance or mixture and uses advised against:**

· **Product Description**

This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.

· **Details of the Supplier of the Safety Data Sheet:**

· **Manufacturer/Supplier:**

PLATIT, Inc.  
 1840 Industrial Drive, Suite 220  
 Libertyville, IL 60048-9466  
 PHONE: (847) 680-5270 (For product information)  
 FAX: (847) 680-5271  
 EMAIL: usa@platit.com

· **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

### 2 Hazard(s) Identification

· **Classification of the substance or mixture:**

The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.

· **Label elements:**

· **GHS label elements:** Non-Regulated Material

· **Hazard pictograms:** Non-Regulated Material

· **Signal word:** Non-Regulated Material

· **Hazard statements:** Non-Regulated Material

· **Unknown acute toxicity:**

25 % of the mixture consists of component(s) of unknown toxicity.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



· **HMIS-ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

· **Hazard(s) not otherwise classified (HNOC):** None known

### 3 Composition/Information on Ingredients

· **Chemical characterization: Mixtures**

· **Description:** Mixture of substances listed below with non-hazardous additions.

· **Dangerous Components:**

CAS: 7429-90-5 RTECS: BD 0330000	Aluminium	 Flam. Sol. 2, H228	50-75%
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(Contd. on page 2)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiAlCN**

CAS: 7440-32-6 RTECS: XR 1700000	Titanium	⚠ Skin Sens. 1, H317; Eye Irrit. 2B, H320	5-25%
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· **Additional information:** TiAlCN coating accounts for less than 1% of complete part or tool.

### 4 First-Aid Measures

- **Description of first aid measures:**
- **General information:**  
Symptoms of poisoning may occur after exposure to dust, fumes or particulates; seek medical attention if feeling unwell.  
No special measures required.
- **After inhalation:**  
Supply fresh air. If required, provide artificial respiration. Consult doctor if symptoms persist.  
In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If swallowed and symptoms occur, consult a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**  
No further relevant information available.

### 5 Fire-Fighting Measures

- **Extinguishing media:**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Advice for firefighters:**
- **Protective equipment:**  
Mouth respiratory protective device.  
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

### 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**  
Dispose contaminated material as waste according to section 13.  
Ensure adequate ventilation.  
Dispose of the collected material according to regulations.
- **Reference to other sections:**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and Storage

- **Handling**
- **Precautions for safe handling:**  
No special measures required.  
Avoid creating and breathing dust/fume/gas/mist/vapors/spray.  
Ensure good ventilation/exhaustion at the workplace.

(Contd. on page 3)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiAlCN**

- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Keep receptacle tightly sealed.
- **Specific end use(s):** No further relevant information available.

### \* 8 Exposure Controls/Personal Protection

- **Additional information about design of technical systems:** No further data; see section 7.
- **Control parameters:**
- **Components with occupational exposure limits:**  
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists that were valid during the creation of this SDS were used as basis.
- **Exposure controls:**
- **Personal protective equipment:**
- **General protective and hygienic measures:** Keep away from foodstuffs, beverages and feed.
- **Breathing equipment:** Not required.
- **Protection of hands:** Not required.
- **Material of gloves:** Not required.
- **Penetration time of glove material:** Not applicable.
- **Eye protection:** Not required.

### 9 Physical and Chemical Properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**
- Form:** Solid
- Color:** Dark
- **Odor:** Odorless
- **Odor threshold:** Not determined.
- **pH-value:** Not applicable.
- **Change in condition**
- Melting point/Melting range:** Not determined.
- Boiling point/Boiling range:** 2460 °C (4460 °F)
- **Flash point:** None
- **Flammability (solid, gaseous):** Not determined.
- **Ignition temperature:** 400 °C (752 °F)
- **Decomposition temperature:** Not determined.
- **Auto igniting:** Product is not self-igniting.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:**
- Lower:** Not determined.
- Upper:** Not determined.

(Contd. on page 4)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiAlCN**

- **Vapor pressure:** Not applicable.
- **Density:**
  - Relative density:** Not determined.
  - Vapor density:** Not applicable.
  - Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with:**
  - Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - Dynamic:** Not applicable.
  - Kinematic:** Not applicable.
- **Solvent content:**
  - Organic solvents:** 0.0 %
  - Solids content:** 100.0 %
- **Other information:** No further relevant information available.

### 10 Stability and Reactivity

- **Reactivity:** No further relevant information available.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

### 11 Toxicological Information

- **Information on toxicological effects:**
- **Acute toxicity:**

- **LD/LC50 values that are relevant for classification:**

#### 7429-90-5 Aluminium

Oral	LD50	>2000 mg/kg (rat)
Inhalative	LC50/4 h	888 mg/l (rat)

- **Primary irritant effect:**
- **On the skin:** No irritating effect.
- **On the eye:** No irritating effect.
- **Additional toxicological information:**  
 The product is not subject to classification according to internally approved calculation methods for preparations.  
 When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
- **Carcinogenic categories:**

- **IARC (International Agency for Research on Cancer):**

None of the ingredients are listed.

- **NTP (National Toxicology Program):**

None of the ingredients are listed.

(Contd. on page 5)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiAlCN**

**· OSHA-Ca (Occupational Safety & Health Administration):**

None of the ingredients are listed.

### 12 Ecological Information

**· Toxicity:**

- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability:** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential:** No further relevant information available.
- **Mobility in soil:** No further relevant information available.
- **Additional ecological information:**

**· General notes:**

Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.

**· Results of PBT and vPvB assessment:**

- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects:** No further relevant information available.

### 13 Disposal Considerations

**· Waste treatment methods:**

**· Recommendation:**

Smaller quantities can be disposed of with household waste.  
Observe all federal, state and local environmental regulations when disposing of this material.

**· Uncleaned packagings**

- **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport Information

**· UN-Number:**

· **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material

**· UN proper shipping name:**

· **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material

**· Transport hazard class(es):**

· **DOT, ADR, ADN, IMDG, IATA**

· **Class:** Non-Regulated Material

**· Packing group:**

· **DOT, ADR, IMDG, IATA** Non-Regulated Material

**· Environmental hazards:**

Not applicable.

**· Special precautions for user:**

Not applicable.

**· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:**

Not applicable.

**· UN "Model Regulation":**

Non-Regulated Material

### 15 Regulatory Information

**· Safety, health and environmental regulations/legislation specific for the substance or mixture:**

**· SARA (Superfund Amendments and Reauthorization):**

**· Section 355 (extremely hazardous substances):**

None of the ingredients are listed.

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiAlCN**

<b>· Section 313 (Specific toxic chemical listings):</b>		
7429-90-5	Aluminium	
<b>· TSCA (Toxic Substances Control Act):</b>		
All ingredients are listed or exempt from listing.		
<b>· California Proposition 65:</b>		
<b>· Chemicals known to cause cancer:</b>		
None of the ingredients are listed.		
<b>· Chemicals known to cause reproductive toxicity for females:</b>		
None of the ingredients are listed.		
<b>· Chemicals known to cause reproductive toxicity for males:</b>		
None of the ingredients are listed.		
<b>· Chemicals known to cause developmental toxicity:</b>		
None of the ingredients are listed.		
<b>· New Jersey Right-to-Know List:</b>		
7429-90-5	Aluminium	
7440-32-6	Titanium	
7727-37-9	Nitrogen	
<b>· New Jersey Special Hazardous Substance List:</b>		
7429-90-5	Aluminium	F3, R1
7440-32-6	Titanium	F3, R1
<b>· Pennsylvania Right-to-Know List:</b>		
None of the ingredients are listed.		
<b>· Pennsylvania Special Hazardous Substance List:</b>		
7429-90-5	Aluminium	E
<b>· Carcinogenic categories:</b>		
<b>· EPA (Environmental Protection Agency):</b>		
None of the ingredients are listed.		
<b>· TLV (Threshold Limit Value established by ACGIH):</b>		
7429-90-5	Aluminium	A4
<b>· NIOSH-Ca (National Institute for Occupational Safety and Health):</b>		
None of the ingredients are listed.		
<b>· GHS label elements</b> Non-Regulated Material		
<b>· Hazard pictograms:</b> Non-Regulated Material		
<b>· Signal word:</b> Non-Regulated Material		
<b>· Hazard statements:</b> Non-Regulated Material		
<b>· National regulations:</b>		
The product is subject to be classified according with the latest version of the regulations on hazardous substances.		
<b>· Chemical safety assessment:</b> A Chemical Safety Assessment has not been carried out.		

**16 Other Information**

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of  
(Contd. on page 7)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiAlCN**

this information and the suitability of the material or product for any particular purpose.

· **Date of preparation / last revision:** 04/06/2016 / 1

· **Abbreviations and acronyms:**

ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road

ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

BEI: Biological Exposure Limit

Flam. Sol. 2: Flammable solids, Hazard Category 2

Eye Irrit. 2B: Serious eye damage/eye irritation, Hazard Category 2B

Skin Sens. 1: Sensitisation - Skin, Hazard Category 1

· **\* Data compared to the previous version altered.**

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## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

### 1 Identification

· **Product Identifier**

· **Trade name:** TiAlN, AlTiN

· **Relevant identified uses of the substance or mixture and uses advised against:**

· **Product Description**

This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.

· **Details of the Supplier of the Safety Data Sheet:**

· **Manufacturer/Supplier:**

PLATIT, Inc.  
 1840 Industrial Drive, Suite 220  
 Libertyville, IL 60048-9466  
 PHONE: (847) 680-5270 (For product information)  
 FAX: (847) 680-5271  
 EMAIL: usa@platit.com

· **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

### 2 Hazard(s) Identification

· **Classification of the substance or mixture:**

The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.

· **Label elements:**

· **GHS label elements:** Non-Regulated Material

· **Hazard pictograms:** Non-Regulated Material

· **Signal word:** Non-Regulated Material

· **Hazard statements:** Non-Regulated Material

· **Unknown acute toxicity:**

41.7 % of the mixture consists of component(s) of unknown toxicity.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



· **HMIS-ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

· **Hazard(s) not otherwise classified (HNOC):** None known

### 3 Composition/Information on Ingredients

· **Chemical characterization: Mixtures**

· **Description:** Mixture: consisting of non-regulated material.

· **Dangerous Components:**

CAS: 7429-90-5 RTECS: BD 0330000	Aluminium	 Flam. Sol. 2, H228	50-70%
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(Contd. on page 2)



## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiAlN, AlTiN**

CAS: 7440-32-6 RTECS: XR 1700000	Titanium	⚠ Skin Sens. 1, H317; Eye Irrit. 2B, H320	30-50%
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· **Additional information:** TiAlN, AlTiN coating accounts for less than 1% of complete part or tool.

### 4 First-Aid Measures

- **Description of first aid measures:**
- **General information:** No special measures required.
- **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
- **After eye contact:**  
Rinse opened eye for at least 15 minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** If swallowed and symptoms occur, consult a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**  
No further relevant information available.

### 5 Fire-Fighting Measures

- **Extinguishing media:**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Advice for firefighters:**
- **Protective equipment:**  
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

### 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**  
Dispose of the collected material according to regulations.
- **Reference to other sections:**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and Storage

- **Handling**
- **Precautions for safe handling:** No special measures required.
- **Information about protection against explosions and fires:** Protect from heat.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**  
Keep receptacle tightly sealed.  
Store in cool, dry conditions in well sealed receptacles.
- **Specific end use(s):** No further relevant information available.

(Contd. on page 3)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

Trade name: **TiAlN, AlTiN**

### \* 8 Exposure Controls/Personal Protection

- **Additional information about design of technical systems:** No further data; see section 7.
- **Control parameters:**
- **Components with occupational exposure limits:**  
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists that were valid during the creation of this SDS were used as basis.
- **Exposure controls:**
- **Personal protective equipment:**
- **General protective and hygienic measures:**  
Keep away from foodstuffs, beverages and feed.  
Immediately remove all soiled and contaminated clothing and wash before reuse.  
Avoid contact with the eyes and skin.
- **Breathing equipment:** Not required.
- **Protection of hands:**



Protective gloves

- **Material of gloves:** Not required.
- **Penetration time of glove material:** Not applicable.
- **Eye protection:**



Tightly sealed goggles

### 9 Physical and Chemical Properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**

<b>Form:</b>	Solid
<b>Color:</b>	Grey
<b>Odor:</b>	Odorless
<b>Odor threshold:</b>	Not determined.
<b>pH-value:</b>	Not applicable.
- **Change in condition**

<b>Melting point/Melting range:</b>	Not determined.
<b>Boiling point/Boiling range:</b>	2460 °C (4460 °F)
- **Flash point:** None
- **Flammability (solid, gaseous):** Not determined.
- **Ignition temperature:** 400 °C (752 °F)
- **Decomposition temperature:** Not determined.
- **Auto igniting:** Product is not self-igniting.

(Contd. on page 4)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiAlN, AlTiN**

- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:**
  - Lower:** Not determined.
  - Upper:** Not determined.
- **Vapor pressure:** Not applicable.
- **Density @ 20 °C (68 °F):** 3.454 g/cm<sup>3</sup> (28.824 lbs/gal)
- **Relative density:** Not determined.
- **Vapor density:** Not applicable.
- **Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with:**
  - Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - Dynamic:** Not applicable.
  - Kinematic:** Not applicable.
- **Solvent content:**
  - Organic solvents:** 0.0 %
  - Solids content:** 100.0 %
- **Other information:** No further relevant information available.

### 10 Stability and Reactivity

- **Reactivity:** No further relevant information available.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

### 11 Toxicological Information

- **Information on toxicological effects:**
- **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

**7429-90-5 Aluminium**

Oral	LD50	>2000 mg/kg (rat)
Inhalative	LC50/4 h	888 mg/l (rat)

- **Primary irritant effect:**
- **On the skin:** No irritating effect.
- **On the eye:** No irritating effect.
- **Sensitization:** Sensitization possible through skin contact.
- **Additional toxicological information:**

The product is not subject to classification according to internally approved calculation methods for preparations.

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

(Contd. on page 5)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

Trade name: TiAlN, AlTiN

· **Carcinogenic categories:**

· **IARC (International Agency for Research on Cancer):**

None of the ingredients are listed.

· **NTP (National Toxicology Program):**

None of the ingredients are listed.

· **OSHA-Ca (Occupational Safety & Health Administration):**

None of the ingredients are listed.

### 12 Ecological Information

· **Toxicity:**

· **Aquatic toxicity:** No further relevant information available.

· **Persistence and degradability:** No further relevant information available.

· **Behavior in environmental systems:**

· **Bioaccumulative potential:** No further relevant information available.

· **Mobility in soil:** No further relevant information available.

· **Additional ecological information:**

· **General notes:**

Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.

· **Results of PBT and vPvB assessment:**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Other adverse effects:** No further relevant information available.

### 13 Disposal Considerations

· **Waste treatment methods:**

· **Recommendation:**

Smaller quantities can be disposed of with household waste.

Observe all federal, state and local environmental regulations when disposing of this material.

· **Uncleaned packagings**

· **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport Information

· **UN-Number:**

· **DOT, ADR, ADN, IMDG, IATA**

Non-Regulated Material

· **UN proper shipping name:**

· **DOT, ADR, ADN, IMDG, IATA**

Non-Regulated Material

· **Transport hazard class(es):**

· **DOT, ADR, ADN, IMDG, IATA**

· **Class:**

Non-Regulated Material

· **Packing group:**

· **DOT, ADR, IMDG, IATA**

Non-Regulated Material

· **Environmental hazards:**

Not applicable.

· **Special precautions for user:**

Not applicable.

· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:**

Not applicable.

· **UN "Model Regulation":**

Non-Regulated Material

(Contd. on page 6)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiAlN, AlTiN**

### 15 Regulatory Information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture:**
- **SARA (Superfund Amendments and Reauthorization):**

· **Section 355 (extremely hazardous substances):**

None of the ingredients are listed.

· **Section 313 (Specific toxic chemical listings):**

7429-90-5 Aluminium

· **TSCA (Toxic Substances Control Act):**

All ingredients are listed or exempt from listing.

· **California Proposition 65:**

· **Chemicals known to cause cancer:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients are listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients are listed.

· **New Jersey Right-to-Know List:**

All ingredients are listed.

· **New Jersey Special Hazardous Substance List:**

7429-90-5	Aluminium	F3, R1
7440-32-6	Titanium	F3, R1

· **Pennsylvania Right-to-Know List:**

None of the ingredients are listed.

· **Pennsylvania Special Hazardous Substance List:**

7429-90-5	Aluminium	E
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· **Carcinogenic categories:**

· **EPA (Environmental Protection Agency):**

None of the ingredients are listed.

· **TLV (Threshold Limit Value established by ACGIH):**

7429-90-5	Aluminium	A4
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· **NIOSH-Ca (National Institute for Occupational Safety and Health):**

None of the ingredients are listed.

- **GHS label elements:** Non-Regulated Material
- **Hazard pictograms:** Non-Regulated Material
- **Signal word:** Non-Regulated Material
- **Hazard statements:** Non-Regulated Material

· **National regulations:**

The product is subject to be classified according with the latest version of the regulations on hazardous substances.

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiAlN, AlTiN**

- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

### 16 Other Information

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

- **Date of preparation / last revision:** 04/06/2016 / 1

- **Abbreviations and acronyms:**

ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road  
 ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways  
 IMDG: International Maritime Code for Dangerous Goods  
 DOT: US Department of Transportation  
 IATA: International Air Transport Association  
 ACGIH: American Conference of Governmental Industrial Hygienists  
 EINECS: European Inventory of Existing Commercial Chemical Substances  
 ELINCS: European List of Notified Chemical Substances  
 CAS: Chemical Abstracts Service (division of the American Chemical Society)  
 NFPA: National Fire Protection Association (USA)  
 HMIS: Hazardous Materials Identification System (USA)  
 LC50: Lethal concentration, 50 percent  
 LD50: Lethal dose, 50 percent  
 PBT: Persistent, Bioaccumulative and Toxic  
 vPvB: very Persistent and very Bioaccumulative  
 NIOSH: National Institute for Occupational Safety  
 OSHA: Occupational Safety & Health  
 TLV: Threshold Limit Value  
 PEL: Permissible Exposure Limit  
 REL: Recommended Exposure Limit  
 BEI: Biological Exposure Limit  
 Flam. Sol. 2: Flammable solids, Hazard Category 2  
 Eye Irrit. 2B: Serious eye damage/eye irritation, Hazard Category 2B  
 Skin Sens. 1: Sensitisation - Skin, Hazard Category 1

- **\* Data compared to the previous version altered.**

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## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

\* **1 Identification**

· **Product Identifier**

· **Trade name: TiB2**

· **CAS Number:**

12045-63-5

· **Relevant identified uses of the substance or mixture and uses advised against:**

· **Product Description**

This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.

· **Details of the Supplier of the Safety Data Sheet:**

· **Manufacturer/Supplier:**

PLATIT, Inc.

1840 Industrial Drive, Suite 220

Libertyville, IL 60048-9466

PHONE: (847) 680-5270 (For product information)

FAX: (847) 680-5271

EMAIL: usa@platit.com

· **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

\* **2 Hazard(s) Identification**

· **Classification of the substance or mixture:**

The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.

· **Label elements:**

· **GHS label elements:** Non-Regulated Material

· **Hazard pictograms:** Non-Regulated Material

· **Signal word:** Non-Regulated Material

· **Hazard statements:** Non-Regulated Material

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



· **HMIS-ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

· **Hazard(s) not otherwise classified (HNOC):** None known

\* **3 Composition/Information on Ingredients**

· **Chemical characterization: Substance**

· **CAS No. Description**

12045-63-5 Titanium boride

· **Dangerous Components:** Non-Regulated Material

· **Additional information:** TiB2 coating accounts for less than 1% of complete part or tool.

(Contd. on page 2)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

Trade name: **TiB2**

### 4 First-Aid Measures

- **Description of first aid measures:**
- **General information:** No special measures required.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If swallowed and symptoms occur, consult a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**  
No further relevant information available.

### 5 Fire-Fighting Measures

- **Extinguishing media:**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Advice for firefighters:**
- **Protective equipment:**  
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

### 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**  
Dispose of the collected material according to regulations.
- **Reference to other sections:**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and Storage

- **Handling**
- **Precautions for safe handling:** No special measures required.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s):** No further relevant information available.

### \* 8 Exposure Controls/Personal Protection

- **Additional information about design of technical systems:** No further data; see section 7.
- **Control parameters:**
- **Components with occupational exposure limits:**
- **Additional information:** The lists that were valid during the creation of this SDS were used as basis.

(Contd. on page 3)



## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiB2**

- **Exposure controls:**
- **Personal protective equipment:**
- **General protective and hygienic measures:** No special measures required.
- **Breathing equipment:** Not required.
- **Protection of hands:** Not required.
- **Material of gloves:**  
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
- **Penetration time of glove material:** Not applicable.
- **Eye protection:** Not required.

\* **9 Physical and Chemical Properties**

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**
  - Form:** Solid
  - Color:** Grey
- **Odor:** Odorless
- **Odor threshold:** Not determined.
- **pH-value:** Not applicable.
- **Change in condition**
  - Melting point/Melting range:** Not determined.
  - Boiling point/Boiling range:** Not determined.
- **Flash point:** None
- **Flammability (solid, gaseous):** Product is not flammable.
- **Ignition temperature:** Not determined.
- **Decomposition temperature:** Not determined.
- **Auto igniting:** Not determined.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:**
  - Lower:** Not determined.
  - Upper:** Not determined.
- **Vapor pressure:** Not applicable.
- **Density @ 20 °C (68 °F):** 4.52 g/cm<sup>3</sup> (37.719 lbs/gal)
- **Relative density:** Not determined.
- **Vapor density:** Not applicable.
- **Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with:**
  - Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - Dynamic:** Not applicable.
  - Kinematic:** Not applicable.
  - Organic solvents:** 0.0 %

(Contd. on page 4)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

Trade name: **TiB2**

- **Solids content:** 100.0 %
- **Other information:** No further relevant information available.

### 10 Stability and Reactivity

- **Reactivity:** No further relevant information available.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

### \* 11 Toxicological Information

- **Information on toxicological effects:**
- **Acute toxicity:**
- **Primary irritant effect:**
- **On the skin:** No irritating effect.
- **On the eye:** No irritating effect.
- **Additional toxicological information:**  
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.  
The substance is not subject to classification.
- **Carcinogenic categories:**

· <b>IARC (International Agency for Research on Cancer):</b>
--

Substance is not listed.
--------------------------

· <b>NTP (National Toxicology Program):</b>
---

Substance is not listed.
--------------------------

· <b>OSHA-Ca (Occupational Safety &amp; Health Administration):</b>
---

Substance is not listed.
--------------------------

### 12 Ecological Information

- **Toxicity:**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability:** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential:** No further relevant information available.
- **Mobility in soil:** No further relevant information available.
- **Additional ecological information:**
- **General notes:**  
Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.
- **Results of PBT and vPvB assessment:**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects:** No further relevant information available.

(Contd. on page 5)

# Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

Trade name: **TiB2**

## 13 Disposal Considerations

- **Waste treatment methods:**
- **Recommendation:**  
 Smaller quantities can be disposed of with household waste.  
 Observe all federal, state and local environmental regulations when disposing of this material.
- **Uncleaned packagings**
- **Recommendation:** Disposal must be made according to official regulations.

## 14 Transport Information

- **UN-Number:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **UN proper shipping name:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **Transport hazard class(es):**
- **DOT, ADR, ADN, IMDG, IATA**
- **Class:** Non-Regulated Material
- **Packing group:**
- **DOT, ADR, IMDG, IATA** Non-Regulated Material
- **Environmental hazards:** Not applicable.
- **Special precautions for user:** Not applicable.
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.
- **UN "Model Regulation":** Non-Regulated Material

## \*15 Regulatory Information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture:**
- **SARA (Superfund Amendments and Reauthorization):**

· **Section 355 (extremely hazardous substances):**

Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**

Substance is not listed.

· **TSCA (Toxic Substances Control Act):**

Substance is listed.

· **California Proposition 65:**

· **Chemicals known to cause cancer:**

Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**

Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**

Substance is not listed.

· **Chemicals known to cause developmental toxicity:**

Substance is not listed.

· **New Jersey Right-to-Know List:**

Substance is not listed.

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiB2**

<ul style="list-style-type: none"> <li>· <b>New Jersey Special Hazardous Substance List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Pennsylvania Right-to-Know List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Pennsylvania Special Hazardous Substance List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Carcinogenic categories:</b></li> </ul>
<ul style="list-style-type: none"> <li>· <b>EPA (Environmental Protection Agency):</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>TLV (Threshold Limit Value established by ACGIH):</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>NIOSH-Ca (National Institute for Occupational Safety and Health):</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>GHS label elements</b> Non-Regulated Material</li> <li>· <b>Hazard pictograms:</b> Non-Regulated Material</li> <li>· <b>Signal word:</b> Non-Regulated Material</li> <li>· <b>Hazard statements:</b> Non-Regulated Material</li> </ul>
<ul style="list-style-type: none"> <li>· <b>National regulations:</b></li> </ul>
<ul style="list-style-type: none"> <li>Non-Regulated Material</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Chemical safety assessment:</b> A Chemical Safety Assessment has not been carried out.</li> </ul>

**16 Other Information**

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

- **Date of preparation / last revision:** 04/06/2016 / 1
  - **Abbreviations and acronyms:**  
 ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road  
 ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways  
 IMDG: International Maritime Code for Dangerous Goods  
 DOT: US Department of Transportation  
 IATA: International Air Transport Association  
 ACGIH: American Conference of Governmental Industrial Hygienists  
 EINECS: European Inventory of Existing Commercial Chemical Substances  
 ELINCS: European List of Notified Chemical Substances  
 CAS: Chemical Abstracts Service (division of the American Chemical Society)  
 NFPA: National Fire Protection Association (USA)  
 HMIS: Hazardous Materials Identification System (USA)  
 LD50: Lethal dose, 50 percent  
 PBT: Persistent, Bioaccumulative and Toxic  
 vPvB: very Persistent and very Bioaccumulative  
 NIOSH: National Institute for Occupational Safety  
 OSHA: Occupational Safety & Health  
 TLV: Threshold Limit Value  
 PEL: Permissible Exposure Limit  
 REL: Recommended Exposure Limit  
 BEI: Biological Exposure Limit  
 LC50: Lethal concentration, 50 percent
  - **\* Data compared to the previous version altered.**
- SDS created by MSDS Authoring Services    www.msdsauthoring.com    +1-877-204-9106

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

### 1 Identification

· **Product Identifier**

· **Trade name:** TiCN, TiCN-MP

· **CAS Number:**

12627-33-7

· **Relevant identified uses of the substance or mixture and uses advised against:**

· **Product Description**

This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.

· **Details of the Supplier of the Safety Data Sheet:**

· **Manufacturer/Supplier:**

PLATIT, Inc.

1840 Industrial Drive, Suite 220

Libertyville, IL 60048-9466

PHONE: (847) 680-5270 (For product information)

FAX: (847) 680-5271

EMAIL: usa@platit.com

· **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

### 2 Hazard(s) Identification

· **Classification of the substance or mixture:**

The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.

· **Label elements:**

· **GHS label elements:** Non-Regulated Material

· **Hazard pictograms:** Non-Regulated Material

· **Signal word:** Non-Regulated Material

· **Hazard statements:** Non-Regulated Material

· **Unknown acute toxicity:**

100 % of the mixture consists of component(s) of unknown toxicity.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



· **HMIS-ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

· **Hazard(s) not otherwise classified (HNOC):** None known

### 3 Composition/Information on Ingredients

· **Chemical characterization: Substance**

· **CAS No. Description**

12627-33-7 Titanium Carbonitride

· **Additional information:** TiCN, TiCN-MP coating accounts for less than 1% of complete part or tool.

(Contd. on page 2)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

Trade name: **TiCN, TiCN-MP**

### 4 First-Aid Measures

- **Description of first aid measures:**
- **General information:** No special measures required.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If swallowed and symptoms occur, consult a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**  
No further relevant information available.

### 5 Fire-Fighting Measures

- **Extinguishing media:**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Advice for firefighters:**
- **Protective equipment:**  
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

### 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**  
Dispose of the collected material according to regulations.
- **Reference to other sections:**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and Storage

- **Handling**
- **Precautions for safe handling:** No special measures required.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s):** No further relevant information available.

### 8 Exposure Controls/Personal Protection

- **Additional information about design of technical systems:** No further data; see section 7.

(Contd. on page 3)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiCN, TiCN-MP**

· **Control parameters:**

· **Components with occupational exposure limits:**

**12627-33-7 Titanium Carbonitride**

TLV Long-term value: 10 mg/m<sup>3</sup>

· **Additional information:** The lists that were valid during the creation of this SDS were used as basis.

· **Exposure controls:**

· **Personal protective equipment:**

· **General protective and hygienic measures:** No special measures required.

· **Breathing equipment:** Not required.

· **Protection of hands:** Not required.

· **Material of gloves:**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· **Penetration time of glove material:** Not applicable.

· **Eye protection:** Not required.

### 9 Physical and Chemical Properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

**Form:** Solid

**Color:** Silver grey

· **Odor:** Odorless

· **Odor threshold:** Not determined.

· **pH-value:** Not applicable.

· **Change in condition**

**Melting point/Melting range:** Not determined.

**Boiling point/Boiling range:** Not determined.

· **Flash point:** None

· **Flammability (solid, gaseous):** Product is not flammable.

· **Ignition temperature:** Not determined.

· **Decomposition temperature:** Not determined.

· **Auto igniting:** Not determined.

· **Danger of explosion:** Product does not present an explosion hazard.

· **Explosion limits:**

**Lower:** Not determined.

**Upper:** Not determined.

· **Vapor pressure:** Not applicable.

· **Density @ 20 °C (68 °F):** 5.6 g/cm<sup>3</sup> (46.732 lbs/gal)

· **Relative density:** Not determined.

· **Vapor density:** Not applicable.

· **Evaporation rate:** Not applicable.

(Contd. on page 4)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiCN, TiCN-MP**

- **Solubility in / Miscibility with:**
  - Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - Dynamic:** Not applicable.
  - Kinematic:** Not applicable.
- **Organic solvents:** 0.0 %
- **Solids content:** 100.0 %
- **Other information:** No further relevant information available.

### 10 Stability and Reactivity

- **Reactivity:** No further relevant information available.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

### 11 Toxicological Information

- **Information on toxicological effects:**
- **Acute toxicity:**
- **Primary irritant effect:**
- **On the skin:** No irritating effect.
- **On the eye:** No irritating effect.
- **Additional toxicological information:**  
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.  
The substance is not subject to classification.
- **Carcinogenic categories:**

· <b>IARC (International Agency for Research on Cancer):</b>
Substance is not listed.

· <b>NTP (National Toxicology Program):</b>
Substance is not listed.

· <b>OSHA-Ca (Occupational Safety &amp; Health Administration):</b>
Substance is not listed.

### 12 Ecological Information

- **Toxicity:**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability:** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential:** No further relevant information available.
- **Mobility in soil:** No further relevant information available.

(Contd. on page 5)



## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiCN, TiCN-MP**

· **Additional ecological information:**

· **General notes:**

Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.

· **Results of PBT and vPvB assessment:**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Other adverse effects:** No further relevant information available.

### 13 Disposal Considerations

· **Waste treatment methods:**

· **Recommendation:**

Smaller quantities can be disposed of with household waste.

Observe all federal, state and local environmental regulations when disposing of this material.

· **Uncleaned packagings**

· **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport Information

· **UN-Number:**

· **DOT, ADR, ADN, IMDG, IATA**

Non-Regulated Material

· **UN proper shipping name:**

· **DOT, ADR, ADN, IMDG, IATA**

Non-Regulated Material

· **Transport hazard class(es):**

· **DOT, ADR, ADN, IMDG, IATA**

· **Class:**

Non-Regulated Material

· **Packing group:**

· **DOT, ADR, IMDG, IATA**

Non-Regulated Material

· **Environmental hazards:**

Not applicable.

· **Special precautions for user:**

Not applicable.

· **Transport in bulk according to Annex II of**

**MARPOL73/78 and the IBC Code:**

Not applicable.

· **UN "Model Regulation":**

Non-Regulated Material

### 15 Regulatory Information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture:**

· **SARA (Superfund Amendments and Reauthorization):**

· **Section 355 (extremely hazardous substances):**

Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**

Substance is not listed.

· **TSCA (Toxic Substances Control Act):**

Substance is not listed.

· **California Proposition 65:**

· **Chemicals known to cause cancer:**

Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**

Substance is not listed.

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiCN, TiCN-MP**

<ul style="list-style-type: none"> <li>· <b>Chemicals known to cause reproductive toxicity for males:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Chemicals known to cause developmental toxicity:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>New Jersey Right-to-Know List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>New Jersey Special Hazardous Substance List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Pennsylvania Right-to-Know List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Pennsylvania Special Hazardous Substance List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Carcinogenic categories:</b></li> </ul>
<ul style="list-style-type: none"> <li>· <b>EPA (Environmental Protection Agency):</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>TLV (Threshold Limit Value established by ACGIH):</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>NIOSH-Ca (National Institute for Occupational Safety and Health):</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>GHS label elements</b> Non-Regulated Material</li> <li>· <b>Hazard pictograms:</b> Non-Regulated Material</li> <li>· <b>Signal word:</b> Non-Regulated Material</li> <li>· <b>Hazard statements:</b> Non-Regulated Material</li> </ul>
<ul style="list-style-type: none"> <li>· <b>National regulations:</b></li> </ul>
<ul style="list-style-type: none"> <li>Non-Regulated Material</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Chemical safety assessment:</b> A Chemical Safety Assessment has not been carried out.</li> </ul>

**16 Other Information**

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

· **Date of preparation / last revision:** 04/06/2016 / 2

· **Abbreviations and acronyms:**

- ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road
- ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- ACGIH: American Conference of Governmental Industrial Hygienists
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- NFPA: National Fire Protection Association (USA)
- HMIS: Hazardous Materials Identification System (USA)
- LD50: Lethal dose, 50 percent
- PBT: Persistent, Bioaccumulative and Toxic
- vPvB: very Persistent and very Bioaccumulative
- NIOSH: National Institute for Occupational Safety
- OSHA: Occupational Safety & Health
- TLV: Threshold Limit Value

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiCN, TiCN-MP**

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

LC50: Lethal concentration, 50 percent

BEI: Biological Exposure Limit

· **\* Data compared to the previous version altered.**

SDS created by MSDS Authoring Services [www.msdsauthoring.com](http://www.msdsauthoring.com) +1-877-204-9106

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

### 1 Identification

· **Product Identifier**

· **Trade name:** TiCrN, CrTiN

· **Relevant identified uses of the substance or mixture and uses advised against:**

· **Product Description**

This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.

· **Details of the Supplier of the Safety Data Sheet:**

· **Manufacturer/Supplier:**

PLATIT, Inc.  
 1840 Industrial Drive, Suite 220  
 Libertyville, IL 60048-9466  
 PHONE: (847) 680-5270 (For product information)  
 FAX: (847) 680-5271  
 EMAIL: usa@platit.com

· **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

### 2 Hazard(s) Identification

· **Classification of the substance or mixture:**

The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.

· **Label elements:**

· **GHS label elements:** Non-Regulated Material

· **Hazard pictograms:** Non-Regulated Material

· **Signal word:** Non-Regulated Material

· **Hazard statements:** Non-Regulated Material

· **Unknown acute toxicity:**

100 % of the mixture consists of component(s) of unknown toxicity.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



· **HMIS-ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

· **Hazard(s) not otherwise classified (HNOC):** None known

### 3 Composition/Information on Ingredients

· **Non-hazardous components:**

25583-20-4	Titanium nitride	40-60%
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· **Chemical characterization:** Mixtures

· **Description:** Mixture: consisting of non-regulated material.

(Contd. on page 2)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiCrN, CrTiN**

<b>· Dangerous Components:</b>		
24094-93-7	Chromium (III) nitride ⚠ Acute Tox. 4, H302; Acute Tox. 4, H332; Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT SE 3, H335	40-60%

· **Additional information:** TiCrN, CrTiN coating accounts for less than 1% of complete part or tool.

### 4 First-Aid Measures

- **Description of first aid measures:**
- **General information:** No special measures required.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If swallowed and symptoms occur, consult a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**  
No further relevant information available.

### 5 Fire-Fighting Measures

- **Extinguishing media:**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Advice for firefighters:**
- **Protective equipment:**  
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

### 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**  
Dispose of the collected material according to regulations.
- **Reference to other sections:**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and Storage

- **Handling**
- **Precautions for safe handling:** No special measures required.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s):** No further relevant information available.

(Contd. on page 3)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiCrN, CrTiN**

### 8 Exposure Controls/Personal Protection

· **Additional information about design of technical systems:** No further data; see section 7.

· **Control parameters:**

· **Components with occupational exposure limits:**

**24094-93-7 Chromium (III) nitride**

PEL	Short-term value: 0.5 mg/m <sup>3</sup>
-----	---

· **Additional information:** The lists that were valid during the creation of this SDS were used as basis.

· **Exposure controls:**

· **Personal protective equipment:**

· **General protective and hygienic measures:** No special measures required.

· **Breathing equipment:** Not required.

· **Protection of hands:** Not required.

· **Material of gloves:** Not required.

· **Penetration time of glove material:** Not applicable.

· **Eye protection:** Not required.

### 9 Physical and Chemical Properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

<b>Form:</b>	Solid
<b>Color:</b>	Silver or Gold

· <b>Odor:</b>	Odorless
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· <b>Odor threshold:</b>	Not determined.
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· <b>pH-value:</b>	Not applicable.
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· **Change in condition**

<b>Melting point/Melting range:</b>	Not determined.
-------------------------------------	-----------------

<b>Boiling point/Boiling range:</b>	Not determined.
-------------------------------------	-----------------

· <b>Flash point:</b>	None
-----------------------	------

· <b>Flammability (solid, gaseous):</b>	Not determined.
---	-----------------

· <b>Ignition temperature:</b>	Not determined.
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· <b>Decomposition temperature:</b>	Not determined.
-------------------------------------	-----------------

· <b>Auto igniting:</b>	Product is not self-igniting.
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· <b>Danger of explosion:</b>	Product does not present an explosion hazard.
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· **Explosion limits:**

<b>Lower:</b>	Not determined.
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<b>Upper:</b>	Not determined.
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· <b>Vapor pressure:</b>	Not applicable.
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· <b>Density @ 20 °C (68 °F):</b>	5.555 g/cm <sup>3</sup> (46.356 lbs/gal)
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· <b>Relative density:</b>	Not determined.
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· <b>Vapor density:</b>	Not applicable.
-------------------------	-----------------

· <b>Evaporation rate:</b>	Not applicable.
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(Contd. on page 4)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiCrN, CrTiN**

- **Solubility in / Miscibility with:**
  - Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - Dynamic:** Not applicable.
  - Kinematic:** Not applicable.
- **Solvent content:**
  - Organic solvents:** 0.0 %
  - Solids content:** 100.0 %
- **Other information:** No further relevant information available.

### 10 Stability and Reactivity

- **Reactivity:** No further relevant information available.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

### 11 Toxicological Information

- **Information on toxicological effects:**
- **Acute toxicity:**
- **Primary irritant effect:**
- **On the skin:** No irritating effect.
- **On the eye:** No irritating effect.
- **Additional toxicological information:**  
 The product is not subject to classification according to internally approved calculation methods for preparations.  
 When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

- **Carcinogenic categories:**

- **IARC (International Agency for Research on Cancer):**

None of the ingredients are listed.

- **NTP (National Toxicology Program):**

None of the ingredients are listed.

- **OSHA-Ca (Occupational Safety & Health Administration):**

None of the ingredients are listed.

### 12 Ecological Information

- **Toxicity:**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability:** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential:** No further relevant information available.
- **Mobility in soil:** No further relevant information available.

(Contd. on page 5)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiCrN, CrTiN**

· **Additional ecological information:**

· **General notes:**

Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.

· **Results of PBT and vPvB assessment:**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Other adverse effects:** No further relevant information available.

### 13 Disposal Considerations

· **Waste treatment methods:**

· **Recommendation:**

Smaller quantities can be disposed of with household waste.

Observe all federal, state and local environmental regulations when disposing of this material.

· **Uncleaned packagings**

· **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport Information

· **UN-Number:**

· **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material

· **UN proper shipping name:**

· **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material

· **Transport hazard class(es):**

· **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material

· **Class:**

· **Packing group:** Non-Regulated Material

· **DOT, ADR, IMDG, IATA** Non-Regulated Material

· **Environmental hazards:** Not applicable.

· **Special precautions for user:** Not applicable.

· **Transport in bulk according to Annex II of**

**MARPOL73/78 and the IBC Code:** Not applicable.

· **UN "Model Regulation":** Non-Regulated Material

### 15 Regulatory Information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture:**

· **SARA (Superfund Amendments and Reauthorization):**

· **Section 355 (extremely hazardous substances):**

None of the ingredients are listed.

· **Section 313 (Specific toxic chemical listings):**

None of the ingredients are listed.

· **TSCA (Toxic Substances Control Act):**

All ingredients are listed or exempt from listing.

· **California Proposition 65:**

· **Chemicals known to cause cancer:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients are listed.



## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiCrN, CrTiN**

· <b>Chemicals known to cause reproductive toxicity for males:</b>
None of the ingredients are listed.
· <b>Chemicals known to cause developmental toxicity:</b>
None of the ingredients are listed.
· <b>New Jersey Right-to-Know List:</b>
None of the ingredients are listed.
· <b>New Jersey Special Hazardous Substance List:</b>
None of the ingredients are listed.
· <b>Pennsylvania Right-to-Know List:</b>
None of the ingredients are listed.
· <b>Pennsylvania Special Hazardous Substance List:</b>
None of the ingredients are listed.
· <b>Carcinogenic categories:</b>
· <b>EPA (Environmental Protection Agency):</b>
None of the ingredients are listed.
· <b>TLV (Threshold Limit Value established by ACGIH):</b>
None of the ingredients are listed.
· <b>NIOSH-Ca (National Institute for Occupational Safety and Health):</b>
None of the ingredients are listed.
· <b>GHS label elements</b> Non-Regulated Material
· <b>Hazard pictograms:</b> Non-Regulated Material
· <b>Signal word:</b> Non-Regulated Material
· <b>Hazard statements:</b> Non-Regulated Material
· <b>National regulations:</b>
The product is subject to be classified according with the latest version of the regulations on hazardous substances.
· <b>Chemical safety assessment:</b> A Chemical Safety Assessment has not been carried out.

### 16 Other Information

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

· **Date of preparation / last revision:** 04/06/2016 / 2

· **Abbreviations and acronyms:**

- ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road
- ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- ACGIH: American Conference of Governmental Industrial Hygienists
- EINECS: European Inventory of Existing Commercial Chemical Substances
- ELINCS: European List of Notified Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- NFPA: National Fire Protection Association (USA)
- HMIS: Hazardous Materials Identification System (USA)
- LD50: Lethal dose, 50 percent
- PBT: Persistent, Bioaccumulative and Toxic
- vPvB: very Persistent and very Bioaccumulative

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiCrN, CrTiN**

NIOSH: National Institute for Occupational Safety  
OSHA: Occupational Safety & Health  
TLV: Threshold Limit Value  
PEL: Permissible Exposure Limit  
REL: Recommended Exposure Limit  
LC50: Lethal concentration, 50 percent  
BEI: Biological Exposure Limit  
Acute Tox. 4: Acute toxicity, Hazard Category 4  
Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2  
Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A  
STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3

· **\* Data compared to the previous version altered.**

SDS created by MSDS Authoring Services [www.msdsauthoring.com](http://www.msdsauthoring.com) +1-877-204-9106

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

### \* 1 Identification

· **Product Identifier**

· **Trade name:** TiN

· **CAS Number:**

25583-20-4

· **EC number:**

247-117-5

· **Relevant identified uses of the substance or mixture and uses advised against:**

· **Product Description**

This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.

· **Details of the Supplier of the Safety Data Sheet:**

· **Manufacturer/Supplier:**

PLATIT, Inc.

1840 Industrial Drive, Suite 220

Libertyville, IL 60048-9466

PHONE: (847) 680-5270 (For product information)

FAX: (847) 680-5271

EMAIL: usa@platit.com

· **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

### 2 Hazard(s) Identification

· **Classification of the substance or mixture:**

The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.

· **Label elements:**

· **GHS label elements:** Non-Regulated Material

· **Hazard pictograms:** Non-Regulated Material

· **Signal word:** Non-Regulated Material

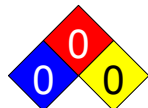
· **Hazard statements:** Non-Regulated Material

· **Unknown acute toxicity:**

100 % of the mixture consists of component(s) of unknown toxicity.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 0

Fire = 0

Reactivity = 0

· **HMS-ratings (scale 0 - 4)**



HEALTH 0 Health = 0

FIRE 0 Fire = 0

REACTIVITY 0 Reactivity = 0

· **Hazard(s) not otherwise classified (HNOC):** None known

### \* 3 Composition/Information on Ingredients

· **Chemical characterization: Substance**

· **CAS No. Description**

25583-20-4 Titanium nitride

(Contd. on page 2)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiN**

- **Identification number(s)**
- **EC number:** 247-117-5
- **Additional information:** TiN coating accounts for less than 1% of complete part or tool.

### 4 First-Aid Measures

- **Description of first aid measures:**
- **General information:** No special measures required.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If swallowed and symptoms occur, consult a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**  
No further relevant information available.

### 5 Fire-Fighting Measures

- **Extinguishing media:**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Advice for firefighters:**
- **Protective equipment:**  
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

### 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**  
Dispose of the collected material according to regulations.
- **Reference to other sections:**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and Storage

- **Handling**
- **Precautions for safe handling:** No special measures required.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s):** No further relevant information available.

### 8 Exposure Controls/Personal Protection

- **Additional information about design of technical systems:** No further data; see section 7.

(Contd. on page 3)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

Trade name: TiN

- **Control parameters:**
- **Components with occupational exposure limits:**
- **Additional information:** The lists that were valid during the creation of this SDS were used as basis.
- **Exposure controls:**
- **Personal protective equipment:**
- **General protective and hygienic measures:** No special measures required.
- **Breathing equipment:** Not required.
- **Protection of hands:** Not required.
- **Material of gloves:**  
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
- **Penetration time of glove material:** Not applicable.
- **Eye protection:** Not required.

### 9 Physical and Chemical Properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**
  - **Form:** Solid
  - **Color:** Brown
  - **Odor:** Odorless
  - **Odor threshold:** Not determined.
  - **pH-value:** Not applicable.
- **Change in condition**
  - **Melting point/Melting range:** 2947 °C (5337 °F)
  - **Boiling point/Boiling range:** Not determined.
- **Flash point:** None
- **Flammability (solid, gaseous):** Product is not flammable.
- **Ignition temperature:** Not determined.
- **Decomposition temperature:** Not determined.
- **Auto igniting:** Not determined.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:**
  - **Lower:** Not determined.
  - **Upper:** Not determined.
- **Vapor pressure:** Not applicable.
- **Density @ 20 °C (68 °F):** 5.21 g/cm<sup>3</sup> (43.477 lbs/gal)
- **Relative density:** Not determined.
- **Vapor density:** Not applicable.
- **Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with:**
  - **Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.

(Contd. on page 4)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiN**

- **Viscosity:**
  - Dynamic:** Not applicable.
  - Kinematic:** Not applicable.
  - Organic solvents:** 0.0 %
  - Solids content:** 100.0 %
- **Other information:** No further relevant information available.

### 10 Stability and Reactivity

- **Reactivity:** No further relevant information available.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

### 11 Toxicological Information

- **Information on toxicological effects:**
- **Acute toxicity:**
- **Primary irritant effect:**
- **On the skin:** No irritating effect.
- **On the eye:** No irritating effect.
- **Additional toxicological information:**  
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.  
The substance is not subject to classification.

- **Carcinogenic categories:**

<b>· IARC (International Agency for Research on Cancer):</b>
Substance is not listed.

<b>· NTP (National Toxicology Program):</b>
Substance is not listed.

<b>· OSHA-Ca (Occupational Safety &amp; Health Administration):</b>
Substance is not listed.

### 12 Ecological Information

- **Toxicity:**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability:** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential:** No further relevant information available.
- **Mobility in soil:** No further relevant information available.
- **Additional ecological information:**
- **General notes:**  
Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.
- **Results of PBT and vPvB assessment:**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiN**

- **Other adverse effects:** No further relevant information available.

### 13 Disposal Considerations

- **Waste treatment methods:**
- **Recommendation:**  
Smaller quantities can be disposed of with household waste.  
Observe all federal, state and local environmental regulations when disposing of this material.
- **Uncleaned packagings**
- **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport Information

- **UN-Number:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **UN proper shipping name:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **Transport hazard class(es):**
- **DOT, ADR, ADN, IMDG, IATA**
- **Class:** Non-Regulated Material
- **Packing group:**
- **DOT, ADR, IMDG, IATA** Non-Regulated Material
- **Environmental hazards:** Not applicable.
- **Special precautions for user:** Not applicable.
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.
- **UN "Model Regulation":** Non-Regulated Material

### 15 Regulatory Information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture:**
- **SARA (Superfund Amendments and Reauthorization):**

- **Section 355 (extremely hazardous substances):**

Substance is not listed.

- **Section 313 (Specific toxic chemical listings):**

Substance is not listed.

- **TSCA (Toxic Substances Control Act):**

Substance is listed.

- **California Proposition 65:**

- **Chemicals known to cause cancer:**

Substance is not listed.

- **Chemicals known to cause reproductive toxicity for females:**

Substance is not listed.

- **Chemicals known to cause reproductive toxicity for males:**

Substance is not listed.

- **Chemicals known to cause developmental toxicity:**

Substance is not listed.

(Contd. on page 6)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: TiN**

<ul style="list-style-type: none"> <li>· <b>New Jersey Right-to-Know List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>New Jersey Special Hazardous Substance List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Pennsylvania Right-to-Know List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Pennsylvania Special Hazardous Substance List:</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Carcinogenic categories:</b></li> </ul>
<ul style="list-style-type: none"> <li>· <b>EPA (Environmental Protection Agency):</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>TLV (Threshold Limit Value established by ACGIH):</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>NIOSH-Ca (National Institute for Occupational Safety and Health):</b></li> </ul>
<ul style="list-style-type: none"> <li>Substance is not listed.</li> </ul>
<ul style="list-style-type: none"> <li>· <b>GHS label elements</b> Non-Regulated Material</li> <li>· <b>Hazard pictograms:</b> Non-Regulated Material</li> <li>· <b>Signal word:</b> Non-Regulated Material</li> <li>· <b>Hazard statements:</b> Non-Regulated Material</li> </ul>
<ul style="list-style-type: none"> <li>· <b>National regulations:</b></li> </ul>
<ul style="list-style-type: none"> <li>Non-Regulated Material</li> </ul>
<ul style="list-style-type: none"> <li>· <b>Chemical safety assessment:</b> A Chemical Safety Assessment has not been carried out.</li> </ul>

**16 Other Information**

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

· **Date of preparation / last revision:** 04/06/2016 / 1

· **Abbreviations and acronyms:**

- ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road
- ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- ACGIH: American Conference of Governmental Industrial Hygienists
- EINECS: European Inventory of Existing Commercial Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- NFPA: National Fire Protection Association (USA)
- HMIS: Hazardous Materials Identification System (USA)
- LD50: Lethal dose, 50 percent
- PBT: Persistent, Bioaccumulative and Toxic
- vPvB: very Persistent and very Bioaccumulative
- NIOSH: National Institute for Occupational Safety
- OSHA: Occupational Safety & Health
- TLV: Threshold Limit Value
- PEL: Permissible Exposure Limit
- REL: Recommended Exposure Limit
- BEI: Biological Exposure Limit
- LC50: Lethal concentration, 50 percent

· **\* Data compared to the previous version altered.**



## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

### \* 1 Identification

- **Product Identifier**

- **Trade name:** ZrN

- **CAS Number:**

25658-42-8

- **EC number:**

247-166-2

- **Relevant identified uses of the substance or mixture and uses advised against:**

- **Product Description**

This is a finished coating applied to tools and wear parts in an enclosed process environment. End users are not exposed to health hazards associated with coating components unless the end product is modified after coating.

- **Details of the Supplier of the Safety Data Sheet:**

- **Manufacturer/Supplier:**

PLATIT, Inc.

1840 Industrial Drive, Suite 220

Libertyville, IL 60048-9466

PHONE: (847) 680-5270 (For product information)

FAX: (847) 680-5271

EMAIL: usa@platit.com

- **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

### 2 Hazard(s) Identification

- **Classification of the substance or mixture:**

The product does not need classification according to OSHA HazCom Standard 29 CFR paragraph (d) of §1910.1200(g) and GHS Rev 03.

- **Label elements:**

- **GHS label elements:** Non-Regulated Material

- **Hazard pictograms:** Non-Regulated Material

- **Signal word:** Non-Regulated Material

- **Hazard statements:** Non-Regulated Material

- **Unknown acute toxicity:**

100 % of the mixture consists of component(s) of unknown toxicity.

- **Classification system:**

- **NFPA ratings (scale 0 - 4)**



- **HMS-ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

- **Hazard(s) not otherwise classified (HNOC):** None known

### \* 3 Composition/Information on Ingredients

- **Chemical characterization: Substance**

- **CAS No. Description**

25658-42-8 Zirconium nitride

(Contd. on page 2)

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 04/06/2016

Reviewed on 04/06/2016

**Trade name: ZrN**

- **Identification number(s)**
- **EC number:** 247-166-2
- **Additional information:** ZrN coating accounts for less than 1% of complete part or tool.

### 4 First-Aid Measures

- **Description of first aid measures:**
- **General information:** No special measures required.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If swallowed and symptoms occur, consult a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**  
No further relevant information available.

### 5 Fire-Fighting Measures

- **Extinguishing media:**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Advice for firefighters:**
- **Protective equipment:**  
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

### 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**  
Dispose of the collected material according to regulations.
- **Reference to other sections:**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and Storage

- **Handling**
- **Precautions for safe handling:** No special measures required.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities:**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s):** No further relevant information available.

### 8 Exposure Controls/Personal Protection

- **Additional information about design of technical systems:** No further data; see section 7.

(Contd. on page 3)

## Safety Data Sheet (SDS)

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**Trade name: ZrN**

· **Control parameters:**

· **Components with occupational exposure limits:**

**25658-42-8 Zirconium nitride**

PEL	Long-term value: 5 mg/m <sup>3</sup> as Zr
REL	Short-term value: 10 mg/m <sup>3</sup> Long-term value: 5 mg/m <sup>3</sup> as Zr
TLV	Short-term value: 10 mg/m <sup>3</sup> Long-term value: 5 mg/m <sup>3</sup> as Zr

· **Additional information:** The lists that were valid during the creation of this SDS were used as basis.

· **Exposure controls:**

· **Personal protective equipment:**

· **General protective and hygienic measures:** No special measures required.

· **Breathing equipment:** Not required.

· **Protection of hands:** Not required.

· **Material of gloves:**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· **Penetration time of glove material:** Not applicable.

· **Eye protection:** Not required.

### 9 Physical and Chemical Properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

**Form:** Solid

**Color:** Light yellow

· **Odor:** Odorless

· **Odor threshold:** Not determined.

· **pH-value:** Not applicable.

· **Change in condition**

**Melting point/Melting range:** 2982 °C (5400 °F)

**Boiling point/Boiling range:** Not determined.

· **Flash point:** None

· **Flammability (solid, gaseous):** Product is not flammable.

· **Ignition temperature:** Not determined.

· **Decomposition temperature:** Not determined.

· **Auto igniting:** Not determined.

· **Danger of explosion:** Product does not present an explosion hazard.

· **Explosion limits:**

**Lower:** Not determined.

**Upper:** Not determined.

(Contd. on page 4)

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**Trade name: ZrN**

- **Vapor pressure:** Not applicable.
- **Density @ 20 °C (68 °F):** 6.97 g/cm<sup>3</sup> (58.165 lbs/gal)
- **Relative density:** Not determined.
- **Vapor density:** Not applicable.
- **Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with:**
- **Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
- **Dynamic:** Not applicable.
- **Kinematic:** Not applicable.
- **Organic solvents:** 0.0 %
- **Solids content:** 100.0 %
- **Other information:** No further relevant information available.

### 10 Stability and Reactivity

- **Reactivity:** No further relevant information available.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

### 11 Toxicological Information

- **Information on toxicological effects:**
- **Acute toxicity:**
- **Primary irritant effect:**
- **On the skin:** No irritating effect.
- **On the eye:** No irritating effect.
- **Additional toxicological information:**  
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.  
The substance is not subject to classification.
- **Carcinogenic categories:**

· **IARC (International Agency for Research on Cancer):**

Substance is not listed.

· **NTP (National Toxicology Program):**

Substance is not listed.

· **OSHA-Ca (Occupational Safety & Health Administration):**

Substance is not listed.

### 12 Ecological Information

- **Toxicity:**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability:** No further relevant information available.

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**Trade name: ZrN**

- **Behavior in environmental systems:**
- **Bioaccumulative potential:** No further relevant information available.
- **Mobility in soil:** No further relevant information available.
- **Additional ecological information:**
- **General notes:**  
Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.
- **Results of PBT and vPvB assessment:**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects:** No further relevant information available.

### 13 Disposal Considerations

- **Waste treatment methods:**
- **Recommendation:**  
Smaller quantities can be disposed of with household waste.  
Observe all federal, state and local environmental regulations when disposing of this material.
- **Uncleaned packagings**
- **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport Information

- **UN-Number:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **UN proper shipping name:**
- **DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material
- **Transport hazard class(es):**
- **DOT, ADR, ADN, IMDG, IATA**
- **Class:** Non-Regulated Material
- **Packing group:**
- **DOT, ADR, IMDG, IATA** Non-Regulated Material
- **Environmental hazards:** Not applicable.
- **Special precautions for user:** Not applicable.
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.
- **UN "Model Regulation":** Non-Regulated Material

### 15 Regulatory Information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture:**
- **SARA (Superfund Amendments and Reauthorization):**

· **Section 355 (extremely hazardous substances):**

Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**

Substance is not listed.

· **TSCA (Toxic Substances Control Act):**

Substance is listed.

(Contd. on page 6)

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**Trade name: ZrN**

· **California Proposition 65:**

· <b>Chemicals known to cause cancer:</b>
Substance is not listed.

· <b>Chemicals known to cause reproductive toxicity for females:</b>
Substance is not listed.

· <b>Chemicals known to cause reproductive toxicity for males:</b>
Substance is not listed.

· <b>Chemicals known to cause developmental toxicity:</b>
Substance is not listed.

· <b>New Jersey Right-to-Know List:</b>
Substance is not listed.

· <b>New Jersey Special Hazardous Substance List:</b>
Substance is not listed.

· <b>Pennsylvania Right-to-Know List:</b>
Substance is not listed.

· <b>Pennsylvania Special Hazardous Substance List:</b>
Substance is not listed.

· **Carcinogenic categories:**

· <b>EPA (Environmental Protection Agency):</b>
Substance is not listed.

· <b>TLV (Threshold Limit Value established by ACGIH):</b>	
25658-42-8 Zirconium nitride	A4

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