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Revision number 2

## 1. Identification of the Substance/Preparation and of the Company/Undertaking

### 1.1 Product Identifier

**Product Type** Welding rods, Coated rod (electrode), Welding wire  
**Product Name** **694 Rod/Wire/Electrode/Part**  
**Product Code** PWA694  
  
**Type** Rod/ Solid, Base metals and alloys

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

**Recommended use** Service life. cobalt and/or nickel containing alloys, steels, prefabricated parts and tools. Metallurgical Products. Wear and Corrosion Resistant Welding Consumable. Wear and Corrosion Resistant Components. For use in industrial installations only.  
  
**Uses advised against** Consumer use.

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

**Supplier Identification**  
Aimtek, Inc.  
201 Washington Street  
Auburn, MA 01501  
USA  
  
**Prepared By** Aimtek  
**E-mail** sales@aimtek.com  
**Company Emergency Phone Number** 508-832-5035

### 1.4 Emergency telephone number

**Emergency telephone number** CHEMTREC: +1-703-527-3887 (INTERNATIONAL)  
1-800-424-9300 (NORTH AMERICA)

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

Respiratory Sensitization	Category 1B
Skin Sensitization	Category 1
carcinogenicity	Category 1B
Reproductive Toxicity	Category 2
Specific target organ toxicity (repeated exposure)	Category 2

### 2.2 Label Elements

**Product Name** 694 Rod/Wire/Eelctrode/Part

Product Code PWA694

<b>Signal Word</b>	<b>Danger</b>
<b>hazard statements</b>	H317 - May cause an allergic skin reaction H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled H350i - May cause cancer by inhalation H361f - Suspected of damaging fertility H373 - May cause damage to organs through prolonged or repeated exposure if inhaled
<b>Precautionary Statements</b>	P202 - Do not handle until all safety precautions have been read and understood P260 - Do not breathe dust P270 - Do not eat, drink or smoke when using this product P285 - In case of inadequate ventilation wear respiratory protection P308 + P313 - IF exposed or concerned: Get medical advice/attention P280 - Wear protective gloves/protective clothing/eye protection/face protection
<b>Precautionary Statements</b>	P201 - Obtain special instructions before use P210 - Keep away from heat/sparks/open flames/hot surfaces. — No smoking P264 - Wash hands thoroughly after handling P271 - Use only outdoors or in a well-ventilated area P272 - Contaminated work clothing should not be allowed out of the workplace P281 - Use personal protective equipment as required P284 - Wear respiratory protection P304 + P341 - IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing P330 - Rinse mouth P363 - Wash contaminated clothing before reuse P403 + P233 - Store in a well-ventilated place. Keep container tightly closed P405 - Store locked up

### 2.3 Other Hazards

#### *Welding Hazards*

CAUTION. Welding will create fumes which may be toxic. If welding is performed on plated or coated materials such as galvanised or painted steel, excessive fume may be produced which contains additional hazardous components, and may result in metal fume fever or other health effects. The product and work surface will be hot during and after welding. Electric shock can kill. Arc Rays can injure eyes and burn skin.

### 2.4 Additional Information

#### Potential Health Effects

#### Product information

##### **INHALATION**

May be harmful if inhaled. May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause allergic respiratory reaction.

##### **Eye contact**

May cause eye irritation with susceptible persons.

##### **INGESTION**

Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Ingestion may cause irritation to mucous membranes.

##### **irritation**

Repeated exposure may cause skin dryness or cracking.

##### **sensitization**

May cause sensitization of susceptible persons.

**Chronic Effects  
Chronic Toxicity**

Prolonged exposure may cause chronic effects. CNS and psychiatric effects, Parkinson-like symptoms. Languor, sleepiness and weakness in legs. A stolid masklike appearance of face, emotional disturbances such as uncontrollable laughter and spastic gait with tendency to fall in walking and findings in more advanced cases. Repeated contact may cause allergic reactions in very susceptible persons. Avoid repeated exposure. Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. Repeated or prolonged exposure may cause central nervous system damage. Contains a known or suspected reproductive toxin. This product contains one or more substances which are classified by IARC as carcinogenic to humans (Group I), probably carcinogenic to humans (Group 2A) or possibly carcinogenic to humans (Group 2B).

**carcinogenicity**

This product contains one or more substances which are classified by IARC as carcinogenic to humans (Group I), probably carcinogenic to humans (Group 2A) or possibly carcinogenic to humans (Group 2B).

**Main Symptoms**

May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause allergic skin reaction. Neurological disorders.

**Aggravated Medical Conditions**

Skin disorders, Neurological disorders, Respiratory disorders, Preexisting eye disorders, Allergies, Central nervous system, Blood disorders, Kidney disorders, Liver disorders, Overexposure may cause female and male reproductive disorder(s), Use of alcoholic beverages may enhance toxic effects

**Environmental Hazard**

See section 12 for additional ecological information

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Formula	CAS-No	Weight-%	GHS Classification
Cobalt	Co	7440-48-4	25 - 50	Acute Oral 4 (H302) Acute dust/mist 1 (H330) Eye damage 2 (H319) Resp. Sens. 1B (H334) Skin Sens. 1 (H317) Carc. 1B (H350) Inhalation Repr. tox 2 (H361)Fertility Aquatic Acute 1 M=10(H400) Aquatic Chronic 1 M=1(H410)
Chromium	Cr	7440-47-3	25 - 50	Not classified
Tungsten	W	7440-33-7	10 - 25	Not classified
Nickel	Ni	7440-02-0	1 - 2.5	STOT RE 1 (H372) Resp. tract, inhalation Carc. 2 (H351) Inhalation Skin Sens. 1 (H317) S,7 Aquatic Chronic 3 (H412)
Iron	Fe	7439-89-6	1 - 2.5	Not classified
Carbon	C	7440-44-0	1 - 2.5	Not classified
Silicon Metal	Si	7440-21-3	0.1 - 1	Not classified
Molybdenum	Mo	7439-98-7	0.1 - 1	Not classified
Manganese	Mn	7439-96-5	0.1 - 1	Not classified

**Full text of H-Statements referred to under sections 2 and 3**

H302 - Harmful if swallowed  
H317 - May cause an allergic skin reaction  
H319 - Causes serious eye irritation  
H330 - Fatal if inhaled  
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled  
H350i - May cause cancer by inhalation  
H351 - Suspected of causing cancer if inhaled  
H361f - Suspected of damaging fertility

H372 - Causes damage to the following organs through prolonged or repeated exposure if inhaled:  
Lungs  
H400 - Very toxic to aquatic life  
H410 - Very toxic to aquatic life with long lasting effects  
H412 - Harmful to aquatic life with long lasting effects

## 4. FIRST AID MEASURES

**General Advice** If symptoms persist, call a physician. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

### 4.1 Description of first aid measures

**Eye contact** Keep eye wide open while rinsing. If symptoms persist, call a physician. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

**Skin Contact** Consult a physician if necessary. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash off immediately with soap and plenty of water.

**INHALATION** Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. Oxygen or artificial respiration if needed. Get medical attention. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.

**INGESTION** Do NOT induce vomiting. Drink plenty of water. If symptoms persist, call a physician. Rinse mouth.

**Self-Protection of the First Aider** Self-Protection of the First Aider. Wear suitable gloves.

**4.2. Most important symptoms and effects, both acute and delayed** May cause allergy or asthma symptoms or breathing difficulties if inhaled. CNS and psychiatric effects, Parkinson-like symptoms. Languor, sleepiness and weakness in legs. A stolid masklike appearance of face, emotional disturbances such as uncontrollable laughter and spastic gait with tendency to fall in walking and findings in more advanced cases. Persons with a history of asthma, allergies, chronic or recurrent respiratory disease should not be exposed to any process in which this product is used.

**4.3 Indication of any immediate medical attention and special treatment needed** Treat symptomatically. May cause sensitization by inhalation and skin contact.

**Notes to physician** Treat symptomatically May cause sensitization by inhalation and skin contact May cause sensitization of susceptible persons

## 5. FIRE-FIGHTING MEASURES

### 5.1 Extinguishing media

**Suitable Extinguishing Media** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Extinguishing Media Which Must Not Be Used For Safety Reasons** None.

**5.2 Special hazards arising from the substance or mixture** Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Thermal decomposition can lead to release of irritating and toxic gases and vapors. May cause sensitization by inhalation and skin contact. Carbon oxides.

5.3 Advice for fire- fighters

Use personal protective equipment as required. In the event of fire, wear self-contained breathing apparatus.

**Component information**

Chemical Name	Extinguishing Media for Fires (Suitable)	Extinguishing Media for Fires (Unsuitable)
Chromium	Use extinguishing media appropriate for surrounding fire.	Do not use carbon dioxide, which may form an explosive mixture with powdered chromium.
Silicon Metal	SMALL FIRES: Dry chemical, sand, water spray, foam.; LARGE FIRES: Water spray, fog, foam	-

## 6. ACCIDENTAL RELEASE MEASURES

**6.1 Personal precautions, protective equipment and emergency procedures** Avoid contact with skin and eyes. Ensure adequate ventilation. Use personal protective equipment as required. Avoid dust accumulation in enclosed space.

**6.2 Environmental precautions** Avoid release to the environment.

**6.3 Methods and material for containment and cleaning up** Pick up and transfer to properly labeled containers. Avoid generation of dust. Do not dry sweep dust. Wet dust with water before sweeping or use a vacuum to collect dust.

**6.4 Reference to other sections** See Section 13: DISPOSAL CONSIDERATIONS

## 7. HANDLING AND STORAGE

**7.1 Precautions for safe handling** Do not eat, drink or smoke when using this product. Use personal protective equipment as required. Avoid contact with eyes, skin and clothing. Wash contaminated clothing before reuse. Do not breathe dust/fume/gas/mist/vapors/spray.

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

**Storage**

Keep out of the reach of children. Keep container tightly closed in a dry and well-ventilated place. Keep containers tightly closed in a cool, well-ventilated place.

**Storage Temperature**

**Storage Life**

Stable under normal conditions

**7.3 Specific end use(s)**

Welding. .

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**8.1 Control parameters**

Chemical Name	China	Hong Kong	India	Indonesia	Japan
Cobalt	TWA: 0.05 mg/m <sup>3</sup> STEL: 0.1 mg/m <sup>3</sup>	TWA: 0.02 mg/m <sup>3</sup>	-	TWA: 0.002 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup> OEL 0.05 mg/m <sup>3</sup> OEL (as Co)
Chromium	TWA: 0.05 mg/m <sup>3</sup> STEL: 0.15 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup>	-	TWA: 0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup> OEL
Tungsten	TWA: 5 mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup>	-	-	TWA: 1 mg/m <sup>3</sup>	-
Iron	-	-	-	TWA: 1 mg/m <sup>3</sup>	-
Nickel	TWA: 1 mg/m <sup>3</sup> STEL: 2.5 mg/m <sup>3</sup>	TWA: 1.5 mg/m <sup>3</sup>	-	TWA: 1.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup> OEL
Silicon Metal	-	-	-	TWA: 10 mg/m <sup>3</sup>	-
Molybdenum	TWA: 6 mg/m <sup>3</sup> STEL: 15 mg/m <sup>3</sup>	-	-	TWA: 5 mg/m <sup>3</sup>	-

Manganese	TWA: 0.15 mg/m <sup>3</sup> STEL: 0.45 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup>	1 mg/m <sup>3</sup> TWA (fume) 5 mg/m <sup>3</sup> Ceiling (dust) 0.03 mg/m <sup>3</sup> STEL (fume, as Mn)	TWA: 0.2 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup> OEL 0.2 mg/m <sup>3</sup> OEL (as Mn)
<b>Chemical Name</b>	<b>Korea</b>	<b>Philippines</b>	<b>Singapore</b>	<b>Taiwan</b>	<b>Thailand</b>
Cobalt	TWA: 0.02 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup> TWA (metal dust and fume)	PEL: 0.02 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup> TWA (dust and fume)	-
Chromium	TWA: 0.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup> TWA	PEL: 0.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup> TWA	-
Tungsten	STEL: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup> TWA	STEL: 10 mg/m <sup>3</sup> PEL: 5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup> TWA (as W)	-
Nickel	TWA: 1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup> TWA	PEL: 1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup> TWA	-
Silicon Metal	TWA: 10 mg/m <sup>3</sup>	-	PEL: 10 mg/m <sup>3</sup>	-	-
Molybdenum	TWA: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	-	PEL: 10 mg/m <sup>3</sup>	-	-
Manganese	STEL: 3 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup>	5 mg/m <sup>3</sup> Ceiling	STEL: 3 mg/m <sup>3</sup> PEL: 1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup> TWA (fume) 5 mg/m <sup>3</sup> Ceiling	-
<b>Chemical Name</b>	<b>Vietnam</b>	<b>...</b>	<b>...</b>	<b>...</b>	<b>...</b>
Cobalt	0.05 mg/m <sup>3</sup> TWA 0.1 mg/m <sup>3</sup> STEL	-	-	-	-
Nickel	0.05 mg/m <sup>3</sup> TWA 0.25 mg/m <sup>3</sup> STEL	-	-	-	-
Manganese	0.3 mg/m <sup>3</sup> TWA 0.6 mg/m <sup>3</sup> STEL	-	-	-	-

## 8.2 Exposure controls

### Personal Precautions

Use personal protective equipment as required. Avoid contact with eyes, skin and clothing. Wash hands before eating, drinking or smoking. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product.

### Engineering Controls

Ensure adequate ventilation, especially in confined areas.

### Eye protection

Use suitable eye protection to guard against the effects of welding. Wear safety glasses with side shields (or goggles). Eye-irrigation bottle with pure water.

### Skin protection

Long sleeved clothing. Wear fire/flammable resistant/retardant clothing. Wear impervious gloves and/or clothing if needed to prevent contact with the material. Gloves should be replaced regularly and if there is any sign of damage to the glove material.

### Hand protection

Protective gloves. The product and work surface will be hot during and after welding. Ensure adequate protection is in place to stop individuals from burning themselves.

### Respiratory Protection

Use only with adequate ventilation. If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

### Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Regular cleaning of equipment, work area and clothing is recommended. Keep away from food, drink and animal feeding stuffs. Avoid contact with skin, eyes and clothing. Wash hands before breaks and at the end of workday.

### Special Precautions for Users

Eye-irrigation bottle with pure water. Health Surveillance should be in place for employees who are exposed while using this product. Training required.

### Biological standards

<b>Chemical Name</b>	<b>USA ACGIH -BEI</b>
Cobalt	15 µg/L Medium: urine Time: end of shift at end of workweek Parameter: Cobalt (nonspecific)
<b>Chemical Name</b>	<b>Singapore - BEI</b>
Manganese	50 µg/L Medium: urine Parameter: Manganese
<b>Chemical Name</b>	<b>Japan</b>

Cobalt	3 µg/L Medium: blood Time: within 2 h prior to end of shift at end of work week Parameter: Cobalt; 35 µg/L Medium: urine Time: within 2 h prior to end of shift at end of work week Parameter: Cobalt 3 µg/L Medium: blood Time: within 2 h prior to end of shift at end of work week Parameter: Cobalt (except Cobalt oxides); 35 µg/L Medium: urine Time: within 2 h prior to end of shift at end of work week Parameter: Cobalt (except Cobalt oxides)
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**Environmental Exposure Controls**

Do not allow to enter into soil/subsoil. In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

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

<b>Physical State @20°C</b>	Solid	<b>appearance</b>	Solid, Metallic
<b>Odor</b>	Odorless	<b>Melting Point / Melting Range</b>	1285-1395 °C / 2340-2540 °F
<b>Flash Point</b>	Not applicable	<b>vapor pressure</b>	Not applicable
<b>vapor density</b>	Not applicable	<b>Water Solubility</b>	Insoluble in water
<b>Dynamic Viscosity</b>	Solid	<b>Density VALUE</b>	8.44 g/cm3

**9.2. Other information**

**VOC content (%)** Not applicable

**Component information**

Chemical Name	Mol. Weight	Water Solub.	Vap. Press.	Vap. Dens.	pH Val.	Autoign. Temp.	Evap. Rate	Boil. Temp.
Cobalt	58.93 g/mol	-	0.00007 hPa at 1050 °C	-	-	-	-	2870 °C
Chromium	51.99 g/mol	-	-	-	-	-	-	2642 °C
Tungsten	183.84 g/mol	-	0.00000001 hPa at 1700 °C	-	-	-	-	-
Nickel	58.69 g/mol	-	1 mmHg at 1810 °C	-	-	-	-	-
Iron	55.84 g/mol	-	0.000001 hPa at 25 °C	-	-	>100 °C	-	-
Carbon	12.01 g/mol	-	-	-	-	300 - 500 °C	-	-
Silicon Metal	28.08 g/mol	<1 mg/L	-	-	-	-	-	-
Molybdenum	95.95 g/mol	0 mg/L at 20 °C	-	-	-	-	-	4612 °C at 101.3 hPa
Manganese	54.93 g/mol	-	1 mmHg at 1292 °C	-	-	-	-	-
Chemical Name	Density VALUE	Melt. Temp.	flash point	Water Sol.	Bulk Dens.	Odor	State	Color
Cobalt	8.85 - 8.9 g/cm3 at 20 °C	<1495 °C	-	insoluble	-	-	-	-
Chromium	7.19 g/cm3 at 20 °C	1900 °C	-	insoluble	-	-	-	grey
Tungsten	19.3 g/cm3 at 20 °C	3422 °C	-	slightly soluble	2100 - 9000 kg/m³	-	-	-
Nickel	8.9 g/cm3 at 25 °C	-	-	insoluble	-	-	-	-
Iron	7.87 g/cm3 at 25 °C	1539 °C	-	insoluble	3000 - 4000 kg/m³	-	-	-
Carbon	-	>=3500 °C	-	insoluble	0.25 - 0.75 kg/m³ at 20 °C	-	-	-
Silicon Metal	2.33 g/cm3 at 25 °C	1410 °C	-	-	-	-	-	dark grey; dark brown

Molybdenum	10.2 g/cm <sup>3</sup> at 20 °C	2617 °C (sublimes)	-	insoluble	-	-	-	-
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## 10. STABILITY AND REACTIVITY

- 10.1 Reactivity** Stable under normal conditions.
- 10.2 Chemical stability** Stable under normal conditions
- 10.3 Possibility of hazardous reactions** Stable under normal conditions.
- 10.4 Conditions to avoid** Keep away from sources of heat (e.g. hot surfaces), sparks and open flames.
- 10.5 Incompatible materials** Acids. Strong oxidizing agents.
- 10.6 Hazardous decomposition products** Thermal decomposition can lead to release of toxic/corrosive gases and vapors.

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

#### Product information

<b>Acute Toxicity</b>	
<b>INHALATION</b>	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
<b>Eye contact</b>	May cause eye irritation with susceptible persons.
<b>Skin Contact</b>	Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. Prolonged contact may cause redness and irritation. Prolonged skin contact may defat the skin and produce dermatitis. May cause sensitization by skin contact.
<b>Respiratory Sensitization</b>	Category 1B
<b>carcinogenicity</b>	Category 1B
<b>Reproductive, developmental and teratogenic effects</b>	Contains a known or suspected reproductive toxin.
<b>Neurological Effects</b>	Repeated or prolonged exposure may cause central nervous system damage. Prolonged or excessive exposure to manganese in dust or fume may cause irreversible central nervous system damage (Manganism). Symptoms resemble Parkinson's disease and include tremors, impaired speech, mask like face and impaired movement.
<b>INGESTION</b>	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea Ingestion may cause irritation to mucous membranes
<b>irritation</b>	Repeated exposure may cause skin dryness or cracking.
<b>corrosivity</b>	No information available
<b>sensitization</b>	May cause sensitization of susceptible persons

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Cobalt	550 mg/kg bw	>2000 mg/kg bw	0.05 mg/L
Chromium	LD50 >5000 mg/kg bw	Data waiving - Study Scientifically Unjustified	LC50 >5.41 mg/L air (analytical)
Tungsten	LD50 >2000 mg/kg bw	LD50 >2000 mg/kg bw	LC50 >5.4 mg/L air
Carbon	> 10000 mg/kg ( Rat )	-	-
Iron	= 984 mg/kg ( Rat )	-	-



Nickel	>9000 mg/kg bw	Data waiving - Other Justification	NOAEC $\geq$ 10.2 mg/L air
Silicon Metal	LD50 >3160 mg/kg bw	LD50 >5000 mg/kg bw	Acutely Non Toxic
Molybdenum	LD50 >2000 mg/kg bw	Not Classified	LC50 >3.92 mg/L air
Manganese	LD50 >2000 mg/kg bw	Data waiving - Study Scientifically Unjustified	LC50 >5.14 mg/L air (analytical)

### Chronic Toxicity

Prolonged exposure may cause chronic effects. CNS and psychiatric effects, Parkinson-like symptoms. Languor, sleepiness and weakness in legs. A stolid masklike appearance of face, emotional disturbances such as uncontrollable laughter and spastic gait with tendency to fall in walking and findings in more advanced cases. Repeated contact may cause allergic reactions in very susceptible persons. Avoid repeated exposure. Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. Repeated or prolonged exposure may cause central nervous system damage. Contains a known or suspected reproductive toxin. This product contains one or more substances which are classified by IARC as carcinogenic to humans (Group I), probably carcinogenic to humans (Group 2A) or possibly carcinogenic to humans (Group 2B).

### **carcinogenicity**

This product contains one or more substances which are classified by IARC as carcinogenic to humans (Group I), probably carcinogenic to humans (Group 2A) or possibly carcinogenic to humans (Group 2B).

### **Carcinogenic Effects**

The table below indicates whether each agency has listed any ingredient as a carcinogen

Chemical Name	IARC	China - Carcinogens	India - Carcinogens	Indonesia - Carcinogens
Cobalt	Group 2B - Possible Human Carcinogen	Possibly carcinogenic to humans	-	A3 - confirmed animal carcinogen
Chromium	Group 3 - Not Classified as a Human Carcinogen	-	-	A4 - not classifiable as a human carcinogen
Nickel	Nickel Compounds: Group 1 - Known Human Carcinogen - Nickel, Metallic & Alloy: Group 2B - Possible Human Carcinogen	Possibly carcinogenic to humans	-	-
Chemical Name	Japan	Japan - ISHL Designated Carcinogens	Korea - Carcinogens	Philippines
Cobalt	Group 2B	-	2 - Limited evidence of human or animal carcinogenicity (metal dust and fume, Serial No. 519)	-
Nickel	Group 1 Group 2B	-	2 - Limited evidence of human or animal carcinogenicity (metal, Serial No. 045)	-

### **Mutagenic effects**

None known

### **Reproductive Toxicity**

Contains a known or suspected reproductive toxin.

### **developmental toxicity**

None known

### **Target Organ Effects**

Blood, Central Nervous System (CNS), Central Vascular System (CVS), EYES, Kidney, Liver, Lungs, Nasal cavities, Respiratory system, skin

### **Neurological Effects**

Repeated or prolonged exposure may cause central nervous system damage. Prolonged or excessive exposure to manganese in dust or fume may cause irreversible central nervous system damage (Manganism). Symptoms resemble Parkinson's disease and include tremors, impaired speech, mask like face and impaired movement.

### 11.2 Other Information

#### Substance related information

None

## 12. ECOLOGICAL INFORMATION

### 12.1. Ecotoxicity

**ecotoxicity**

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Chemical Name	Algae Toxicity	Acute Fish Toxicity	Toxicity to microorganisms	Toxicity to daphnia and other aquatic invertebrates
Cobalt	LC50-144 ug/L (fresh water); LC50-24.1 µg/l (sea water); NOEC-4.9 µg/l (fresh water); NOEC-1.23 µg/l (sea water)	LC50-1.5 mg/l (fresh water); NOEC-351.4 mg/L	Not available	LC50-0.61 mg/l (fresh water); LC50-2.32 mg/l (sea water); NOEC-5.47 µg/L (fresh water); NOEC-206 µg/L (sea water)
Chromium	Data Waiving - Study Scientifically Unjustified	Data Waiving - Study Scientifically Unjustified	Not available	Data Waiving - Study Scientifically Unjustified
Tungsten	Read Across - EC50 >17.7 mg/L	Read Across - NOEC > 9.8 mg/L	Not available	EC50 50 mg/L
Nickel	EC10 - 316.5 ug/L	LC50 - 15.3 mg/L	Not available	LC50 >200ug/L (@6-6.5 pH), 13ug/L (@8-8.5pH)
Iron	NOEC - 1.4 mg/L	Data Waiving - Study Scientifically Unjustified	Not available	Data Waiving - Study Scientifically Unjustified
Silicon Metal	Data Waiving - Study Scientifically Unjustified	Data Waiving - Other Justification	Not available	Data Waiving - Study Scientifically Unjustified
Molybdenum	EC10 - 150 mg/L, NOEL - 169.9 ,h/L	LC50 - 609 mg/L	Not available	EC50 - 2847.5 mg/L
Manganese	EC50 - 4.5 mg/L	NOEC - 3.6 mg/L	Not available	EC 50 > 1.6 mg/L

**12.2 Persistence and degradability** Product/Substance is inorganic. Not applicable.

**12.3 Bioaccumulative potential** This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).

**12.4 Mobility in soil** No information available

**12.5 Results of PBT and vPvB assessment** The components in this formulation do not meet the criteria for classification as PBT or vPvB

**12.6 Other adverse effects** None known

## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

**disposal considerations**

It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Improper disposal or reuse of this container may be dangerous and illegal. Refer to applicable local, state and federal regulations as well as industry standards.

Waste from Residues/Unused Products

Reuse or recycle. Recover or recycle if possible. Dispose of in accordance with local regulations.

Contaminated Packaging

Empty containers should be taken to an approved waste handling site for recycling or disposal.

**other information**

Waste codes should be assigned by the user based on the application for which the product was used.

## 14. TRANSPORT INFORMATION

**IMO / IMDG** NOT REGULATED

**ICAO / IATA-DGR** NOT REGULATED

**China (IECSC)** NOT REGULATED

**Australia Dangerous Goods**

**Japan** NOT REGULATED

## 15. REGULATORY INFORMATION

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

**Other Regulations** None

All of the components in the product are on the following Inventory lists

Chemical Name	China - Chemicals Regulated under National Standard (GB)	China - List of Dangerous Chemicals
Silicon Metal	-	Present (powder, amorphous)
Manganese	-	Present (powder, wetted with >=25% water)
Chemical Name	India - Hazardous and Toxic Chemicals	Japan - ISHL Disclosure cut-off list
Cobalt	Present (powder)	Ignitable substance (listed under Metallic powder) >=0.1% Group 2, >1 % in preparations (Group 2 substance under supervision, listed under Cobalt and its inorganic compounds)
Chromium	Present (powder)	>=0.1%
Tungsten	-	Ignitable substance (listed under Metallic powder) >=1%
Nickel	Present (powder)	>=0.1%
Silicon Metal	-	Ignitable substance (listed under Metallic powder)
Molybdenum	Present (powder)	Ignitable substance (listed under Metallic powder) >=0.1%
Manganese	-	>=0.1% Group 2, >1 % in preparations (Group 2 substance under supervision)
Chemical Name	Korea - Substances to Control - Metals	Singapore - Hazardous Substances
Cobalt	1 %	-
Chromium	1 %	-
Tungsten	1 %	-
Iron	1 %	-
Nickel	1 %	-
Manganese	1 %	-
Chemical Name	Thailand - Hazardous Substances	Vietnam - Chemicals
Cobalt	-	1000 kg (powder)
Nickel	-	1000 kg (inhalable powder)

All of the components in the product are on the following Inventory lists

Chemical Name	IECSC - China Inventory of Existing Chemical Substances	Inventory - Japan - Existing and New Chemical Substances	Inventory - Japan - Industrial Safety and Health Law Substances	Inventory - Korea - Existing Chemicals Inventory	Inventory - Philippines - Inventory of Chemicals and	Inventory - Taiwan - Taiwan Chemical Substance

		(ENCS)	(ISHL)	(KECI/KECL)	Chemical Substances (PICCS)	Inventory (TCSI)
Cobalt	Present [13762]	-	>1 % weight (listed under Cobalt and its inorganic compounds)	Present [KE-06060]	Present	Present
Chromium	Present [13603]	-	-	Present [KE-05970]	Present	Present
Tungsten	Present [34920]	-	-	Present [KE-35000]	Present	Present
Carbon	Present [34023]	-	-	Present [KE-04671]	Present	Present
Iron	Present [34355]	-	-	Present [KE-21059]	Present	Present
Nickel	Present [25343]	-	-	Present [KE-25818]	Present	Present
Silicon Metal	Present [13814]	-	-	Present [KE-31029]	Present	Present
Molybdenum	Present [25031]	-	-	Present [KE-25427]	Present	Present
Manganese	Present [24928]	-	-	Present [KE-22999]	Present	Present

**15.2 Chemical Safety Assessment** Chemical Safety Assessment not available at product level.

## 16. OTHER INFORMATION

### Global Automotive Declarable Substance List Classifications

Chemical Name	Global Automotive Declarable Substance List Classifications	Global Automotive Declarable Substance List Thresholds
Cobalt	Declarable Substance (FI)	0.1 %
Nickel	Declarable Substance (FI)	0.1 %

**Prepared By** Aimtek

**Issuing Date** 2018-01-29

**Revision date** 2018-01-29

**Revision note** This SDS has been revised in the following section(s)  
 Section 1: Identification: Product identifier and chemical identity  
 Section 7: Handling and storage, including how the chemical may be safely used  
 Section 8: Exposure controls and personal protection  
 Section 15: REGULATORY INFORMATION

### Disclaimer

Aimtek urges each customer or recipient of this SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific SDSs, we are not and cannot be responsible for SDS's obtained from any source other than ourselves. If you have obtained an SDS from another source or if you are not sure that the SDS you have is current, please contact us for the most current version

End of Safety Data Sheet