

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product Identifier

Product Type Welding powder
Product name **Deloro 6325 powder**
Product code KSPN1018-3

Type Powder

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

Recommended Use Wear and Corrosion Resistant Welding Consumable. For use in industrial installations only.

Uses advised against None reasonably foreseeable.

1.3 Details of the supplier of the safety data sheet

Importer **Prepared by** Kennametal Inc. 1600 Technology Way
 Latrobe, PA 15650, USA

For further information, please contact:

E-mail k-corp-product.safety@kennametal.com
Emergency Telephone Number CHEMTREC: +1-703-527-3887 (INTERNATIONAL)
 1-800-424-9300 (NORTH AMERICA)
NRC (National Response Center) UK, National Poisons Information Service +44 844 892 0111
 Ireland, Poisons Information Centre of Ireland +353 1 809 2166
 Australia, NSW Poisons Information Centre +61 131126
 New Zealand, New Zealand National Poisons Centre +64 800 764 766
 South Africa, Bloemfontein Poison Control and Medicine Information Centre, +27 824 910 160

2. Hazards Identification

2.1 Classification of the substance or mixture

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

Skin sensitization	Category 1
Carcinogenicity	Category 2
Specific target organ toxicity (repeated exposure)	Category 1

2.2 Label Elements

Product name Deloro 6325 powder
Product code KSPN1018-3



signal word	DANGER
Hazard Statements	H317 - May cause an allergic skin reaction H351 - Suspected of causing cancer H372 - Causes damage to organs through prolonged or repeated exposure if inhaled
EU Specific Hazard Statements	EUH208 - Contains (Nickel). May produce an allergic reaction.
precautionary statements	P260 - Do not breathe dust/fume/gas/mist/vapors/spray P264 - Wash hands thoroughly after handling P270 - Do not eat, drink or smoke when using this product P273 - Avoid release to the environment P308 + P313 - IF exposed or concerned: Get medical advice/attention P280 - Wear protective gloves/protective clothing/eye protection/face protection P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
precautionary statements	P201 - Obtain special instructions before use P202 - Do not handle until all safety precautions have been read and understood P210 - Keep away from heat/sparks/open flames/hot surfaces. — No smoking P271 - Use only outdoors or in a well-ventilated area P272 - Contaminated work clothing should not be allowed out of the workplace P285 - In case of inadequate ventilation wear respiratory protection P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention P363 - Wash contaminated clothing before reuse

2.3 Other Hazards

WARNING May cause sensitization by skin contact. Vapors may be irritating to eyes, nose, throat, and lungs. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

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. Arc Rays can injure eyes and burn skin. Electric shock can kill. The product and work surface will be hot during and after welding.

2.4 Additional Information

Product Information

Potential health effects

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	Contact with eyes may cause irritation. Particulates may cause irritation due to mechanical abrasion. 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	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.
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, Blood disorders, Kidney disorders, Liver disorders, Overexposure may cause female and male reproductive disorder(s)
environmental hazard	See Section 12 for additional Ecological Information.

3. Composition/information on Ingredients

Chemical name	Formula	EC No	CAS-No	weight-%	GHS Classification	REACH Reg. No
Nickel	Ni	231-111-4	7440-02-0	> 50	STOT RE 1 (H372) S,7 Carc. 2 (H351) S,7 Skin Sens. 1 (H317) S,7 Aquatic Chronic 3 (H412)	No data available
Chromium	Cr	231-157-5	7440-47-3	10 - 25	Not classified	No data available
Silicon Metal	Si	231-130-8	7440-21-3	3 - 5	Not classified	No data available
Iron	Fe	231-096-4	7439-89-6	3 - 5	Not classified	No data available
Boron	B	231-151-2	7440-42-8	3 - 5	Not classified	No data available
Molybdenum	Mo	231-107-2	7439-98-7	2.5 - 3	Not classified	No data available
Copper	Cu	231-159-6	7440-50-8	2.5 - 3	Aqua. Acute 1 (H400) Aqua. Cron. 3 (H412) M=1	No data available
Carbon	C	231-153-3	7440-44-0	0.1 - 1	Not classified	No data available

NOTE This product may contain additional substances with a content of less than 0.1 % per substance, which are not listed. May contain additional substances in a range up to 2 % which are not classified hazardous or may not contribute to the products overall classification.

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

H317 - May cause an allergic skin reaction
H351 - Suspected of causing cancer if inhaled
H372 - Causes damage to the following organs through prolonged or repeated exposure if inhaled:
Lungs
H412 - Harmful to aquatic life with long lasting effects

4. First aid measures

General advice Immediate medical attention is required. 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. Call a physician immediately. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

- Skin contact** Immediate medical attention is required. 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. Immediate medical attention is required. If not breathing, give artificial respiration.
- Ingestion** Do NOT induce vomiting. Drink plenty of water. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately. Rinse mouth.
- Self-protection of the first aider** Wear suitable gloves. Self-protection of the first aider.

4.2. Most important symptoms and effects, both acute and delayed 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. May cause allergy or asthma symptoms or breathing difficulties if inhaled

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 Pick up and transfer to properly labeled containers. Do not dry sweep dust. Wet dust with

containment and cleaning up water before sweeping or use a vacuum to collect dust.

6.4 Reference to other sections

7. Handling and Storage

7.1 Precautions for safe handling Do not eat, drink or smoke when using this product. In case of insufficient ventilation, wear suitable respiratory equipment. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with eyes, skin and clothing. Wear suitable protective clothing. Use only with adequate ventilation. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.

7.2 Conditions for safe storage, including any incompatibilities Keep in properly labeled containers. 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

incompatible materials

7.3 Specific end use(s) Welding. Restricted to professional users. For use in industrial installations only.

8. Exposure Controls/Personal Protection

8.1 Control parameters

Exposure controls

Chemical name	EU	Austria	Belgium	Czech Republic	Denmark
Nickel	-	Group A1 Carcinogen (dust/aerosol) 2 mg/m ³ STEL KZW (dust, inhalable fraction, as Ni, 4 x 15 min) 0.5 mg/m ³ TWA [TMW] (dust, inhalable fraction)	1 mg/m ³ TWA	0.5 mg/m ³ TWA Ceiling: 1 mg/m ³ Ceiling: 0.25 mg/m ³	0.05 mg/m ³ TWA (dust and powder)
Chromium	2 mg/m ³ TWA	2 mg/m ³ TWA [TMW]	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA (dust) Ceiling: 1.5 mg/m ³	0.5 mg/m ³ TWA (dust)
Silicon Metal	-	-	10 mg/m ³ TWA	-	10 mg/m ³ TWA
Molybdenum	-	20 mg/m ³ STEL [KZW] (inhalable fraction, 2 X 60 min) 10 mg/m ³ TWA [TMW] (inhalable fraction)	-	5 mg/m ³ TWA Ceiling: 25 mg/m ³	-
Copper	-	4 mg/m ³ STEL [KZW] (inhalable fraction, 4 X 15 min); 0.4 mg/m ³ STEL [KZW] (respirable fraction, smoke, 4 X 15 min) 1 mg/m ³ TWA [TMW] (inhalable fraction); 0.1 mg/m ³ TWA [TMW] (respirable fraction, smoke)	0.2 mg/m ³ TWA (fume); 1 mg/m ³ TWA (dust and mist)	1 mg/m ³ TWA (dust); 0.1 mg/m ³ TWA (fume) Ceiling: 2 mg/m ³ Ceiling: 0.2 mg/m ³	1.0 mg/m ³ TWA (dust and powder); 0.1 mg/m ³ TWA (fume)
Carbon	-	5 mg/m ³ TWA [TMW] (alveolar dust with <1% Quartz)	-	-	-
Chemical name	Finland	France	Germany OEL (TWA)	Hungary	Italy
Nickel	1 mg/m ³ TWA	1 mg/m ³ TWA [VME]; 1 mg/m ³ TWA [VME]	-	Ceiling: 0.1 mg/m ³ Ceiling: 0.01 mg/m ³	1.5 mg/m ³ TWA (inhalable fraction)

		(metal gratings)			
Chromium	0.5 mg/m ³ TWA	2 mg/m ³ TWA [VME] (indicative limit)	2 mg/m ³ TWA AGW (inhalable fraction, exposure factor 1)	2 mg/m ³ TWA [AK]	0.5 mg/m ³ TWA
Silicon Metal	-	10 mg/m ³ TWA [VME]	-	-	-
Molybdenum	0.5 mg/m ³ TWA	-	-	-	10 mg/m ³ TWA (inhalable fraction); 3 mg/m ³ TWA (respirable fraction)
Copper	1 mg/m ³ TWA; 0.1 mg/m ³ TWA (respirable dust and fume, as Cu)	0.2 mg/m ³ TWA [VME] (fume); 1 mg/m ³ TWA [VME] (dust, as Cu) 2 mg/m ³ STEL [VLCT] (dust, as Cu)	0.01 mg/m ³ TWA MAK (inhalable fraction) 0.02 mg/m ³ Peak (respirable fraction)	4 mg/m ³ STEL [CK]; 0.4 mg/m ³ STEL [CK] (fume) 1 mg/m ³ TWA [AK]; 0.1 mg/m ³ TWA [AK] (fume)	0.2 mg/m ³ TWA (fume)
Chemical name	Ireland	Luxembourg	Netherlands	Norway	Poland
Nickel	0.5 mg/m ³ TWA	-	-	0.05 mg/m ³ TWA STEL: 0.15 mg/m ³	0.25 mg/m ³ TWA [NDS]
Chromium	2 mg/m ³ TWA	2 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA STEL: 1.5 mg/m ³	0.5 mg/m ³ TWA [NDS]
Silicon Metal	10 mg/m ³ TWA (total inhalable dust); 4 mg/m ³ TWA (respirable dust)	-	-	10 mg/m ³ TWA (equal to the standard for nuisance dust) STEL: 20 mg/m ³	-
Molybdenum	-	-	-	-	4 mg/m ³ TWA [NDS] 10 mg/m ³ STEL [NDSch]
Copper	0.2 mg/m ³ TWA (fume); 1 mg/m ³ TWA (dust and mist) 2 mg/m ³ STEL (dust and mist)	-	0.1 mg/m ³ TWA (inhalable fraction)	0.1 mg/m ³ TWA (fume); 1 mg/m ³ TWA (dust) STEL: 0.3 mg/m ³ STEL: 3 mg/m ³	0.2 mg/m ³ TWA [NDS]
Carbon	-	-	-	-	4.0 mg/m ³ TWA [NDS] (natural, total inhalable dust); 1.0 mg/m ³ TWA [NDS] (natural, respirable dust); 6.0 mg/m ³ TWA [NDS] (synthetic, total inhalable dust)
Chemical name	Portugal	Spain	Switzerland	Sweden	United Kingdom
Nickel	1.5 mg/m ³ TWA [VLE-MP] (inhalable fraction)	1 mg/m ³ TWA [VLA-ED] (manufacturing, commercialization, and use restrictions under REACH)	0.5 mg/m ³ TWA [MAK] (inhalable)	0.5 mg/m ³ LLV (total dust) 0.1 mg/m ³ LLV (except Nickel carbonyl and Trinickeldisulfide, total dust, as Ni)	STEL: 1.5 mg/m ³ TWA: 0.5 mg/m ³
Chromium	0.5 mg/m ³ TWA [VLE-MP]	2 mg/m ³ TWA [VLA-ED] (indicative limit value)	0.5 mg/m ³ TWA [MAK] (inhalable)	0.5 mg/m ³ LLV (total dust)	STEL: 1.5 mg/m ³ TWA: 0.5 mg/m ³
Silicon Metal	-	-	3 mg/m ³ TWA [MAK] (respirable)	-	STEL: 30 ppm STEL: 12 mg/m ³ TWA: 10 mg/m ³ TWA: 4 mg/m ³
Molybdenum	10 mg/m ³ TWA [VLE-MP] (inhalable fraction); 3 mg/m ³ TWA [VLE-MP] (respirable fraction)	10 mg/m ³ TWA [VLA-ED] (inhalable fraction); 3 mg/m ³ TWA [VLA-ED] (respirable fraction)	10 mg/m ³ TWA [MAK] (inhalable)	10 mg/m ³ LLV (total dust); 5 mg/m ³ LLV (respirable dust)	-
Copper	0.2 mg/m ³ TWA [VLE-MP] (fume); 1 mg/m ³ TWA [VLE-MP] (dust and mist, as Cu)	0.2 mg/m ³ TWA [VLA-ED] (fume); 1 mg/m ³ TWA [VLA-ED] (dust and mist, as Cu)	0.1 mg/m ³ TWA [MAK] (inhalable) 0.2 mg/m ³ STEL [KZW] (inhalable, 4 X 15)	1 mg/m ³ LLV (total dust); 0.2 mg/m ³ LLV (respirable dust) 1 mg/m ³ LLV (total dust, as Cu); 0.2 mg/m ³ LLV	STEL: 0.6 mg/m ³ STEL: 2 mg/m ³ TWA: 0.2 mg/m ³ TWA: 1 mg/m ³

				(respirable dust, as Cu)	
Chemical name	Australia	Israel	Russia	South Africa	Turkey
Nickel	1 mg/m ³ TWA	1.5 mg/m ³ TWA (inhalable fraction) 0.750 mg/m ³ AL (inhalable, as as Ni)	MAC: 0.05 mg/m ³	0.05 mg/m ³ TWA 0.5 mg/m ³ TWA	-
Chromium	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA 0.250 mg/m ³ AL (as as Cr)	-	0.5 mg/m ³ TWA	2 mg/m ³ TWA
Silicon Metal	10 mg/m ³ TWA (containing no asbestos and <1% crystalline silica, inhalable dust)	-	-	10 mg/m ³ TWA (inhalable particulate); 5 mg/m ³ TWA (respirable particulate) 10 mg/m ³ TWA (total inhalable dust); 5 mg/m ³ TWA (respirable dust)	-
Iron	-	-	TWA: 10 mg/m ³	-	-
Boron	-	-	TWA: 2 mg/m ³ STEL: 5 mg/m ³	-	-
Molybdenum	10 mg/m ³ TWA (as Mo)	10 mg/m ³ TWA (inhalable fraction); 3 mg/m ³ TWA (respirable fraction)	TWA: 0.5 mg/m ³ STEL: 3 mg/m ³	5 mg/m ³ TWA (soluble); 10 mg/m ³ TWA (insoluble) 20 mg/m ³ STEL (insoluble); 10 mg/m ³ STEL (soluble) 20 mg/m ³ Ceiling (insoluble); 10 mg/m ³ Ceiling (soluble)	-
Copper	1 mg/m ³ TWA (dust and mist); 0.2 mg/m ³ TWA (fume)	0.2 mg/m ³ TWA (fume) 1 mg/m ³ TWA (dust and mist, as Cu)	TWA: 0.5 mg/m ³ STEL: 1 mg/m ³	1 mg/m ³ TWA (dust and mist) 2 mg/m ³ STEL (dust and mist, as Cu) 2 mg/m ³ Ceiling (dust and mist, as Cu) 0.2 mg/m ³ TWA (fume); 1 mg/m ³ TWA (dust and mist, as Cu)	-
Carbon	-	-	-	10 mg/m ³ TWA (inhalable particulate); 5 mg/m ³ TWA (respirable particulate)	-
Chemical name	Egypt OEL	Gulf Coop. OEL
Nickel	1.5 mg/m ³ TWA (total dust)	0.05 mg/m ³ TWA	-	-	-
Chromium	0.5 mg/m ³ TWA	0.05 mg/m ³ TWA	-	-	-
Silicon Metal	10 mg/m ³ TWA	-	-	-	-
Molybdenum	-	10 mg/m ³ TWA (as Mo)	-	-	-
Copper	0.2 mg/m ³ TWA (fume); 1 mg/m ³ TWA (dust and mist, as Cu) 0.2 mg/m ³ TWA (fume); 1 mg/m ³ TWA (dust and mist, as Cu)	1 mg/m ³ TWA (dust); 0.2 mg/m ³ TWA (fume) 1 mg/m ³ TWA (dust); 0.2 mg/m ³ TWA (fume)	-	-	-

Chemical name	Derived No Effect Level (DNEL)	Predicted No Effect Concentration (PNEC)
Nickel	4 mg/m ³ short term local inhalation; 0.05 mg/m ³ long term local inhalation	0.0035-0.0218 mg/l freshwater; 0.0023 mg/l marine water
Chromium	0.5 mg/m ³ local inhalation	-
Iron	3 mg/m ³ local inhalation	-
Molybdenum	11.17 mg/m ³ longterm local inhalation	-
Copper	-	Freshwater 7.8 µg/l, marine water 5.2 µg/l, soil 65 mg/kg

Carbon	10 mg/m ³ systemic inhalation	dw -
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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

Wear safety glasses with side shields (or goggles).

Skin Protection

Wear suitable gloves. Wear suitable protective clothing.

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

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

Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Wash hands thoroughly after handling.

Biological standards

Chemical name	EU - Binding Biological Limit Values and Health Surveillance Measures	Austria	Czech Republic
Nickel	-	7 µg/L Medium: urine Time: after end of work day, at the end of a work week/ end of the shift Parameter: spontaneous urine (only appropriate for urine samples with specific weight >=1010 mg/mL); lung function based on determining, forced vital capacity (FVC), 1 sec - capacitor (FEV1), FEV1%FVC, MEF50	0.077 µmol/mmol Creatinine Medium: urine Time: discretionary Parameter: Nickel; 0.04 mg/g Creatinine Medium: urine Time: discretionary Parameter: Nickel 0.077 µmol/mmol Creatinine Medium: urine Time: discretionary Parameter: Nickel; 0.04 mg/g Creatinine Medium: urine Time: discretionary Parameter: Nickel
Chemical name	Germany - Biological Threshold Limits	Hungary	Ireland - Biological Monitoring
Nickel	-	0.02 mg/g Creatinine Medium: urine Time: at end of workweek, end of shift Parameter: Nickel; 0.038 µmol/mmol Creatinine Medium: urine Time: at end of workweek, end of shift Parameter: Nickel	-
Chromium	-	0.02 mg/g Creatinine Medium: urine Time: end of shift Parameter: Chromium (carcinogenic material; proposed limit value should be treated as "technical value"); 0.043 µmol/mmol Creatinine Medium: urine Time: end of shift Parameter: Chromium (carcinogenic material; proposed limit value should be treated as "technical value")	-

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.

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

Physical State	solid	Appearance	metallic, Powder
Odor	none	Melting point / melting range	965-1040 °C / 1770-1900 °F
flash point	not applicable	Vapor Pressure	not applicable
Vapor Density	not applicable	Water solubility	Insoluble in water
Autoignition temperature	N/A	Dynamic viscosity	solid
Density	8.44 g/cm3	Explosive properties	not applicable

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.
Nickel	58.69 g/mol	-	1 mmHg at 1810 °C	-	-	-	-	-
Chromium	51.99 g/mol	-	-	-	-	-	-	2642 °C
Silicon Metal	28.08 g/mol	<1 mg/L	-	-	-	-	-	-
Iron	55.84 g/mol	-	0.000001 hPa at 25 °C	-	-	>100 °C	-	-
Boron	10.81 g/mol	-	0.0000156 atm at 2140 °C	-	-	-	-	-
Molybdenum	95.95 g/mol	0 mg/L at 20 °C	-	-	-	-	-	4612 °C at 101.3 hPa
Copper	63.54 g/mol	-	0 hPa at 1400 °C	-	-	-	-	2567 °C
Carbon	12.01 g/mol	-	-	-	-	300 - 500 °C	-	-
Chemical name	Density	Melt. Temp.	Flash Point	Water Sol.	Bulk Dens.	Odor	State	color
Nickel	8.9 g/cm3 at 25 °C	-	-	insoluble	-	-	-	-
Chromium	7.19 g/cm3 at 20 °C	1900 °C	-	insoluble	-	-	-	grey
Silicon Metal	2.33 g/cm3 at 25 °C	1410 °C	-	-	-	-	-	dark grey; dark brown
Iron	7.87 g/cm3 at 25 °C	1539 °C	-	insoluble	3000 - 4000 kg/m ³	-	-	-
Molybdenum	10.2 g/cm3 at 20 °C	2617 °C (sublimes)	-	insoluble	-	-	-	-
Copper	8.89 g/cm3 at 20 °C	1083 °C	-	insoluble	-	odorless	-	red
Carbon	-	>=3500 °C	-	insoluble	0.25 - 0.75 kg/m ³ at 20 °C	-	-	-

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

Acute toxicity

Inhalation

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Eye Contact

Contact with eyes may cause irritation. Particulates may cause irritation due to mechanical abrasion. May cause eye irritation with susceptible persons.

Skin contact

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.

Carcinogenicity

Category 2

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.

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

Chemical name	Oral LD50	dermal LD50	Inhalation LC50
Nickel	>9000 mg/kg bw	Data waiving - Other Justification	NOAEC >=10.2 mg/L air
Chromium	LD50 >5000 mg/kg bw	Data waiving - Study Scientifically Unjustified	LC50 >5.41 mg/L air (analytical)
Silicon Metal	LD50 >3160 mg/kg bw	LD50 >5000 mg/kg bw	Acutely Non Toxic
Iron	= 984 mg/kg (Rat)	-	-
Boron	650 mg/kg (Rat)	Not Listed in C&L Inventory	Not Listed in C&L Inventory
Molybdenum	LD50 >2000 mg/kg bw	Not Classified	LC50 >3.92 mg/L air
Carbon	> 10000 mg/kg (Rat)	-	-

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.

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	EU Annex I Carcinogen	Austria - Carcinogens	Belgium - Suspected
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		Information		Carcinogens and Mutagens
Nickel	Nickel Compounds: Group 1 - Known Human Carcinogen - Nickel, Metallic & Alloy: Group 2B - Possible Human Carcinogen	Category 3	Group A1 Carcinogen (dust/aerosol)	-
Chromium	Group 3 - Not Classified as a Human Carcinogen	Category 3	-	-
Chemical name	France - Carcinogens	Germany - Carcinogens	Hungary - Carcinogens	Ireland - Carcinogens
Nickel	-	Category 1 (causes cancer in man)	-	-
Chemical name	Italy - Carcinogens	Netherlands - Carcinogens	Norway - Carcinogens	Portugal - Carcinogens
Nickel	Category 3 Carcinogen A5 - Not Suspected as a Human Carcinogen	-	-	Present Present (refined) A5 - Not Suspected as a Human Carcinogen
Chromium	A4 - Not Classifiable as a Human Carcinogen	-	-	Present A4 - Not Classifiable as a Human Carcinogen
Chemical name	Australia - Carcinogens	New Zealand	Russia - Carcinogens	...
Nickel	-	-	Carcinogen Present (Route of exposure: inhalation)	-
Chemical name	Gulf Coop. Carcinogens	Egypt Carcinogens	South Africa - Carcinogenic Compounds	...
Nickel	Category 1 Carcinogen	Present	Confirmed Human Carcinogen	-
Chromium	Category 1 Carcinogen	Present	-	-

MUTAGENIC EFFECTS

None known

Developmental toxicity

None known

Target organ effects

blood, Eyes, Jaw, kidney, liver, Lungs, Nasal Cavities, respiratory system, Skin, Teeth

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.

Chemical name	Algae toxicity	Acute Fish toxicity	Toxicity to Microorganisms	Daphnia magna
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)
Chromium	Data Waiving - Study Scientifically Unjustified	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
Iron	NOEC - 1.4 mg/L	Data Waiving - Study Scientifically Unjustified	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

- 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**

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.

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

Chemical name	IMO/IMDG - Marine Pollutants
Copper	IMDG regulated marine pollutant (Listed in the index, listed under Copper metal powder)

ADR / RID Not regulated

ICAO / IATA-DGR Not regulated

Australia Dangerous Goods

15. Regulatory Information

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

Legend

15.2 Chemical Safety Assessment Chemical Safety Assessment available for this product
The preparation is classified as dangerous in accordance with Directive 1999/45/EC.

Chemical name	Germany - Water Classification (VwVwS)
Nickel	ID Number 7182, hazard class 2 - hazard to waters (footnote 47) ID Number 7616, hazard class 2 - hazard to waters (particle size <0.1 mm)

Chromium	ID Number 1443, not considered hazardous to water
Iron	ID Number 748, not considered hazardous to water
Boron	ID Number 7094, not considered hazardous to water
Molybdenum	ID Number 1443, not considered hazardous to water
Copper	ID Number 1443, not considered hazardous to water
Carbon	ID Number 801, not considered hazardous to water

International Inventories

Chemical name	EINECS	ELINCS	TSCA	DSL	NDSL	ENCS	IECSC	AICS	KECL
Nickel	-	-	Present	CEPA=Yes (Category=Inorganics; Health Criteria=No, Human Health Priority=Low) Yes (Category=Inorganics; P=yes, B=no, IT=yes)	Present (1994)	-	Present [25343]	-	-
Chromium	-	-	Present	CEPA=Yes (Category=Inorganics; Health Criteria=Yes, Human Health Priority=Mod erate)	Present (1994)	-	Present [13603]	-	-
Silicon Metal	-	-	Present	-	-	-	Present [13814]	-	-
Iron	-	-	Present	-	-	-	Present [34355]	-	-
Boron	-	-	Present	-	-	-	Present [25541]	-	-
Molybdenum	-	-	Present	-	-	-	Present [25031]	-	-
Copper	-	-	Present	CEPA=Yes (Category=Inorganics; Health Criteria=Yes, Human Health Priority=Mod erate)	-	-	Present [34399]	-	-
Carbon	-	-	Present	-	-	-	Present [34023]	-	-

Legend:

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

AICS - Australian Inventory of Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

Chemical name	EU REACH Pre-registered Substances	EU REACH Registered Substances	EU RoHS Substances Restricted or Prohibited in	EU - REACH (1907/2006) - Article 59(1) - Candidate List of Substances for	EU REACH Restrictions on Certain Dangerous Substances
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			Electrical Equipment	Eventual Inclusion in Annex XIV	
Nickel	November 30, 2010	2011-02-18	-	-	Use restricted. See item 27.
Chromium	November 30, 2010	2011-03-17	-	-	-
Silicon Metal	November 30, 2010	2010-12-20	-	-	-
Iron	November 30, 2010	2011-03-17	-	-	-
Boron	November 30, 2010	-	-	-	-
Molybdenum	November 30, 2010	2011-03-17	-	-	-
Copper	November 30, 2010	2011-03-17	-	-	-
Carbon	November 30, 2010	2013-05-17	-	-	-

Chemical name	EU - REACH (1907/2006) - Consultations, intentions, proposals
Copper	<p>Consultation Start: December 18, 2013 Consultation Deadline: February 3, 2014 (flakes coated with aliphatic acid; Proposed harmonised classification and labelling based on CLP see LOLI list 4054; substance classification according to DSD not longer required; The consultation is now over)</p> <p>GHS06 Acute Tox. 3 H331 Consultation Start: December 18, 2013 Consultation Deadline: February 3, 2014 (flakes coated with aliphatic acid, The consultation is now over); GHS07 Acute Tox. 4 H302 Consultation Start: December 18, 2013 Consultation Deadline: February 3, 2014 (flakes coated with aliphatic acid, The consultation is now over); GHS09 Aquatic Acute 1 H400 Consultation Start: December 18, 2013 Consultation Deadline: February 3, 2014 (flakes coated with aliphatic acid, M-factor 10, The consultation is now over); GHS09 Aquatic Chronic 1 H410 Consultation Start: December 18, 2013 Consultation Deadline: February 3, 2014 (flakes coated with aliphatic acid, M-factor 1, The consultation is now over)</p>

Chemical name	Russia Dangerous Substances
Nickel	Present
Iron	Present
Boron	Present (amorphous and crystalline)
Molybdenum	Present
Copper	Present

16. Other Information

Global Automotive Declarable Substance List Classifications

Chemical name	Global Automotive Declarable Substance List Classifications	Global Automotive Declarable Substance List Thresholds
Nickel	Declarable Substance (FI)	0.1 %
Copper	Declarable Substance (FI)	0.1 %

Prepared by Kennametal Inc. 1600 Technology Way Latrobe, PA 15650, USA

Issuing Date 2015-09-12

Revision Date 2015-12-14

Revision Note not applicable

Disclaimer

Kennametal 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