

**1. IDENTIFICATION OF SUBSTANCES / PREPARATION AND COMPANY**

Product Name: Croform Excel Nickel Free Alloy S1  
Product Code: 0143

Application: Dental casting alloy

Company: Davis Schottlander & Davis Ltd  
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**2. HAZARD IDENTIFICATION****Classification of the substance or mixture****Regulation (EC) No 1272/2008:**

This product does not require a hazard communication label as it does not pose a hazard in the form delivered. Hazards can occur while using this product. Please read and follow the instructions of this SDS.

Skin sensitization: Category 1  
Carcinogenicity: Category 1B  
Reproductive toxicity: Category 2

**Classification and labelling has been done according to 67/548/EEC with amendments and 1999/45/EC with amendments. This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006**

**Label Elements**

**Signal word:** DANGER

**Hazard Statements:**

H317 - May cause an allergic skin reaction  
H350i - May cause cancer by inhalation  
H360FD - May damage fertility. May damage the unborn child

**Precautionary Statements:**

P202 - Do not handle until all safety precautions have been read and understood  
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray  
P281 - Use personal protective equipment as required  
P304 + P341 - IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing  
P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P201 - Obtain special instructions before use  
P210 - Keep away from heat/sparks/open flames/hot surfaces. No smoking  
P272 - Contaminated work clothing should not be allowed out of the workplace  
P273 - Avoid release to the environment  
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

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P304 + P341 - IF INHALED: If breathing is difficult, 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  
P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician  
P363 - Wash contaminated clothing before reuse  
P405 - Store locked up

### **Other Hazards**

#### **WARNING:**

May cause sensitisation by skin contact. Vapours may be irritating to eyes, nose, throat and lungs. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

#### **Welding Hazards:**

CAUTION. Welding will create fumes which may be toxic. The product and work surface will be hot during and after welding. Fire Hazard. Ensure adequate protection is in place to stop individuals from burning themselves. Hexavalent Chrome may be formed during welding.

### **Additional 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.

##### **Ingestion:**

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

##### **Irritation:**

Repeated exposure may cause skin dryness or cracking.

##### **Sensitisation:**

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. Contains a known or suspected reproductive toxin.

##### **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, Pre-existing eye disorders,

allergies, kidney disorders, liver disorders, central nervous system, blood 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. MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	Formula	EC No	CAS No	Weight %	GHS Classification	Reach Reg. No.
Cobalt	Co	231-158-0	7440-48-4	>50	Acute Oral 4 (H302) Acute dust/mist 1 H330). Eye damage 2 (H319). Resp. Sens. 1 (H334). WSkin Sens. 1 (H317). Carc. 1B (H350i). Repr. Tox 2 (H361f). Aquatic Acute 1 M=10(H400) Aquatic Chronic 1 M=1(H410)	01-2119517392-44
Chromium	Cr	231-157-5	7440-47-3	25-50	Not classified	No data available
Molybdenum	Mo	231-107-2	7439-98-7	5-10	Not classified	No data available
Silicon Metal	Si	231-130-8	7440-21-3	0.1-1	Not classified	No data available
Manganese	Mn	231-105-1	7439-96-5	01.-1	Not classified	No data available
Iron	Fe	231-096-4	7439-89-6	0.1-1	Not classified	No data available

**NOTE:** This product may contain additional substance with a content of less than 0.1% per substance, which are not listed.

**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

H361f - Suspected of damaging fertility

H400 - Very toxic to aquatic life

H410 - Very toxic 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/vapours/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).

## **Description of first aid measures**

### **Eye contact:**

Keep eye wide open whilst 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.

### **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:**

Wear suitable gloves.

### **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

### **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**

### **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

#### **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 vapours. May cause sensitization by inhalation and skin contact. Carbon oxides.

#### **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	<b>Small fires:</b> Dry Chemical, sand, water spray, foam. <b>Large fires:</b> Water spray, fog, foam.	-

**6. ACCIDENTAL RELEASE MEASURES****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.

**Environmental precautions:**

Avoid release to the environment.

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

Pick up and transfer to properly labelled containers. Avoid generation of dust. Do not dry sweep dust. Wet dust with water before sweeping or use a vacuum to collect dust.

**7. HANDLING AND STORAGE****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/vapours/spray.

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

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

**Incompatible materials:****Specific end use(s):**

Restricted to professional users.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION****Control parameters****Exposure controls:**

Chemical Name	EU	Austria	Belgium	Czech Republic	Denmark
Cobalt	-	2 mg/m <sup>3</sup> STEL KZW (hardened metal, magnet manufacturing, manufacture of Cobalt powder and catalysts (powder processing,	0.02 mg/m <sup>3</sup> TWA (dust and fume)	0.05 mg/m <sup>3</sup> TWA Ceiling: 0.1 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup> TWA (dust, fume and powder)

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		press and mechanical processing of none-sintered parts), inhalable fraction, as Co, 4 x 15 min); 0.4 mg/m <sup>3</sup> STEL KZW (others, inhalable fraction, as Co, 4 x 15 min) 0.5 mg/m <sup>3</sup> TWA [TMW] (hardened metal, magnet manufacturing, manufacture of Cobalt powder and catalysts, inhalable fraction); 0.1 mg/m <sup>3</sup> TWA [TMW] (all others, inhalable fraction)			
Chromium	2 mg/m <sup>3</sup> TWA	2 mg/m <sup>3</sup> TWA [TMW]	0.5 mg/m <sup>3</sup> TWA	0.5 mg/m <sup>3</sup> TWA (dust) Ceiling: 1.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup> TWA (dust)
Molybdenum	-	20 mg/m <sup>3</sup> STEL [KZW] (inhalable fraction, 2 X 60 min) 10 mg/m <sup>3</sup> TWA [TMW] (inhalable fraction)	-	5 mg/m <sup>3</sup> TWA Ceiling: 25 mg/m <sup>3</sup>	-
Silicon Metal	-	-	10 mg/m <sup>3</sup> TWA	-	10 mg/m <sup>3</sup> TWA
Manganese	-	2 mg/m <sup>3</sup> STEL [KZW] (inhalable fraction, 4 X 15 min) 0.5 mg/m <sup>3</sup> TWA [TMW] (inhalable fraction)	0.2 mg/m <sup>3</sup> TWA 0.2 mg/m <sup>3</sup> TWA (as Mn)	1 mg/m <sup>3</sup> TWA Ceiling: 2 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup> TWA (dust, fume and powder); 0.1 mg/m <sup>3</sup> TWA (respirable)
<b>Chemical Name</b>	<b>Finland</b>	<b>France</b>	<b>Germany OEL (TWA)</b>	<b>Hungary</b>	<b>Italy</b>
Cobalt	0.02 mg/m <sup>3</sup> TWA	-	-	0.4 mg/m <sup>3</sup> STEL [CK] 0.1 mg/m <sup>3</sup> TWA [AK]	0.02 mg/m <sup>3</sup> TWA
Chromium	0.5 mg/m <sup>3</sup> TWA	2 mg/m <sup>3</sup> TWA [VME] (indicative limit)	2 mg/m <sup>3</sup> TWA AGW (inhalable fraction, exposure factor 1)	2 mg/m <sup>3</sup> TWA [AK]	0.5 mg/m <sup>3</sup> TWA
Molybdenum	0.5 mg/m <sup>3</sup> TWA	-	-	-	10 mg/m <sup>3</sup> TWA (inhalable fraction); 3 mg/m <sup>3</sup> TWA (respirable fraction)
Silicon Metal	-	10 mg/m <sup>3</sup> TWA [VME]	-	-	-
Manganese	0.2 mg/m <sup>3</sup> TWA (inhalable dust); 0.1 mg/m <sup>3</sup> TWA (respirable)	1 mg/m <sup>3</sup> TWA [VME] (fume, as Mn)	0.2 mg/m <sup>3</sup> TWA MAK (inhalable fraction); 0.02 mg/m <sup>3</sup> TWA MAK (respirable)	20 mg/m <sup>3</sup> STEL [CK] 5 mg/m <sup>3</sup> TWA [AK]	0.2 mg/m <sup>3</sup> TWA

			fraction) 1.6 mg/m <sup>3</sup> Peak (Ceiling factor 1 for Permanganates, inhalable fraction); 0.16 mg/m <sup>3</sup> Peak (Ceiling factor 1 for Permanganates, respirable fraction) 0.5 mg/m <sup>3</sup> TWA AGW (The risk of damage to the embryo or foetus can be excluded when AGW and BGW values are observed, inhalable fraction)		
<b>Chemical Name</b>	<b>Ireland</b>	<b>Luxembourg</b>	<b>Netherlands</b>	<b>Norway</b>	<b>Poland</b>
Cobalt	0.1 mg/m <sup>3</sup> TWA	-	0.02 mg/m <sup>3</sup> TWA (dust and smoke, as Co)	0.02 mg/m <sup>3</sup> TWA (fume) STEL: 0.06 mg/m <sup>3</sup>	0.02 mg/m <sup>3</sup> TWA [NDS] (dust and fume) 0.2 mg/m <sup>3</sup> STEL [NDSch] (dust and fume)
Chromium	2 mg/m <sup>3</sup> TWA	2 mg/m <sup>3</sup> TWA	0.5 mg/m <sup>3</sup> TWA	0.5 mg/m <sup>3</sup> TWA STEL: 1.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup> TWA [NDS]
Molybdenum	-	-	-	-	4 mg/m <sup>3</sup> TWA [NDS] 10 mg/m <sup>3</sup> STEL [NDSch]
Silicon Metal	10 mg/m <sup>3</sup> TWA (total inhalable dust); 4 mg/m <sup>3</sup> TWA (respirable dust)	-	-	10 mg/m <sup>3</sup> TWA (equal to the standard for nuisance dust) STEL: 20 mg/m <sup>3</sup>	-
Manganese	0.2 mg/m <sup>3</sup> TWA (fume, as Mn); 0.2 mg/m <sup>3</sup> TWA 3 mg/m <sup>3</sup> STEL (fume, as Mn)	-	-	1 mg/m <sup>3</sup> TWA (inhalable fraction); 0.1 mg/m <sup>3</sup> TWA (respirable fraction) STEL: 3 ppm STEL: 0.3 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup> TWA [NDS]
<b>Chemical Name</b>	<b>Portugal</b>	<b>Spain</b>	<b>Switzerland</b>	<b>Sweden</b>	<b>United Kingdom</b>
Cobalt	0.02 mg/m <sup>3</sup> TWA [VLE-MP]	0.02 mg/m <sup>3</sup> TWA [VLA-ED]	0.05 mg/m <sup>3</sup> TWA [MAK] (aerosol and dust, inhalable)	0.02 mg/m <sup>3</sup> LLV (total inhalable dust) 0.02 mg/m <sup>3</sup> LLV (total inhalable dust, as Co)	STEL: 0.3 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup>
Chromium	0.5 mg/m <sup>3</sup> TWA [VLE-MP]	2 mg/m <sup>3</sup> TWA [VLA-ED] (indicative limit value)	0.5 mg/m <sup>3</sup> TWA [MAK] (inhalable)	0.5 mg/m <sup>3</sup> LLV (total dust)	STEL: 1.5 mg/m <sup>3</sup> TWA: 0.5 mg/m <sup>3</sup>
Molybdenum	10 mg/m <sup>3</sup> TWA [VLE-MP] (inhalable fraction); 3 g/m <sup>3</sup> TWA [VLE-MP] (respirable fraction)	10 mg/m <sup>3</sup> TWA [VLA-ED] (inhalable fraction); 3 mg/m <sup>3</sup> TWA [VLA-ED] (respirable fraction)	10 mg/m <sup>3</sup> TWA [MAK] (inhalable)	10 mg/m <sup>3</sup> LLV (total dust); 5 mg/m <sup>3</sup> LLV (respirable dust)	-
Silicon Metal	-	-	3 mg/m <sup>3</sup> TWA [MAK] (respirable)	-	STEL: 30 ppm STEL: 12 mg/m <sup>3</sup> TWA: 10 mg/m <sup>3</sup> TWA: 4 mg/m <sup>3</sup>
Manganese	0.2 mg/m <sup>3</sup> TWA [VLE-MP]	0.2 mg/m <sup>3</sup> TWA [VLA-ED]	0.5 mg/m <sup>3</sup> TWA [MAK] (inhalable)	0.2 mg/m <sup>3</sup> LLV (total dust); 0.1 mg/m <sup>3</sup> LLV (respirable dust) 0.2 mg/m <sup>3</sup> LLV (total dust, as	STEL: 1.5 mg/m <sup>3</sup> TWA: 0.5 mg/m <sup>3</sup>

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				Mn); 0.1 mg/m <sup>3</sup> LLV (respirable dust, as Mn)	
<b>Chemical Name</b>	<b>Australia</b>	<b>Israel</b>	<b>Russia</b>	<b>South Africa</b>	<b>Turkey</b>
Cobalt	0.05 mg/m <sup>3</sup> TWA (dust and fume)	0.02 mg/m <sup>3</sup> TWA 0.02 mg/m <sup>3</sup> TWA (as Co) 0.010 mg/m <sup>3</sup> AL (as as Co)	TWA: 0.1 mg/m <sup>3</sup> STEL: 0.05 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup> TWA 0.1 mg/m <sup>3</sup> TWA (dust and fume)	-
Chromium	0.5 mg/m <sup>3</sup> TWA	0.5 mg/m <sup>3</sup> TWA 0.250 mg/m <sup>3</sup> AL (as as Cr)	-	0.5 mg/m <sup>3</sup> TWA	2 mg/m <sup>3</sup> TWA
Molybdenum	10 mg/m <sup>3</sup> TWA (as Mo)	10 mg/m <sup>3</sup> TWA (inhalable fraction); 3 mg/m <sup>3</sup> TWA (respirable fraction)	TWA: 0.5 mg/m <sup>3</sup> STEL: 3 mg/m <sup>3</sup>	5 mg/m <sup>3</sup> TWA (soluble); 10 mg/m <sup>3</sup> TWA (insoluble) 20 mg/m <sup>3</sup> STEL (insoluble); 10 mg/m <sup>3</sup> STEL (soluble) 20 mg/m <sup>3</sup> Ceiling (insoluble); 10 mg/m <sup>3</sup> Ceiling (soluble)	-
Silicon Metal	10 mg/m <sup>3</sup> TWA (containing no asbestos and <1% crystalline silica, inhalable dust)	-	-	10 mg/m <sup>3</sup> TWA (inhalable particulate); 5 mg/m <sup>3</sup> TWA (respirable particulate) 10 mg/m <sup>3</sup> TWA (total inhalable dust); 5 mg/m <sup>3</sup> TWA (respirable dust)	-
Manganese	3 mg/m <sup>3</sup> STEL (fume) 1 mg/m <sup>3</sup> TWA (dust and fume) 1 mg/m <sup>3</sup> TWA	0.1 mg/m <sup>3</sup> TWA (inhalable fraction); 0.02 mg/m <sup>3</sup> TWA 0.1 mg/m <sup>3</sup> TWA (as Mn); 0.02 mg/m <sup>3</sup>	-	1 mg/m <sup>3</sup> TWA (elemental and fume) 3 mg/m <sup>3</sup> STEL (fume, as Mn) 3 mg/m <sup>3</sup> Ceiling (fume, as Mn) 3 mg/m <sup>3</sup> STEL (fume) 5 mg/m <sup>3</sup> TWA (dust); 1 mg/m <sup>3</sup> TWA (fume)	-
Iron	-	-	TWA: 10 mg/m <sup>3</sup>	-	-
<b>Chemical Name</b>	<b>Egypt OEL</b>	<b>Gulf Coop. OEL</b>	...	...	...
Cobalt	0.1 mg/m <sup>3</sup> TWA (as Co)	0.02 mg/m <sup>3</sup> TWA (dust and fume, as Co)	-	-	-
Chromium	0.5 mg/m <sup>3</sup> TWA	0.5 mg/m <sup>3</sup> TWA	-	-	-
Molybdenum	-	10 mg/m <sup>3</sup> TWA (as Mo)	-	-	-
Silicon Metal	10 mg/m <sup>3</sup> TWA	-	-	-	-
Manganese	5 mg/m <sup>3</sup> TWA (as Mn)	0.2 mg/m <sup>3</sup> TWA (as Mn)	-	-	-

Chemical name	Derived No Effect Level (DNEL)	Predicted No Effect Concentration (PNEC)
Cobalt	0.04 mg/m <sup>3</sup> long term local inhalation	2.36 µg Co/l (AF 3) marine water; 0.74 µg/l (AF 3) fresh water
Chromium	0.5 mg/m <sup>3</sup> local inhalation	-
Molybdenum	11.17 mg/m <sup>3</sup> long term local inhalation	-
Manganese	0.2 mg/m <sup>3</sup> systemic inhalation	-
Iron	3 mg/m <sup>3</sup> local inhalation	-



**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.

**Skin Protection:**

Long sleeved clothing. Wear fire/ flame resistant/retardant clothing, apron. Wear suitable protective clothing. Wear suitable gloves.

**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.

**Biological standards**

Chemical Name	EU – Binding Biological Limit Values and Health Surveillance Measures	Austria	Czech Republic
Cobalt	-	10 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	-
Manganese	-	20 µg/L Medium: blood Time: not provided Parameter: whole blood (applies if Manganese contingent neurological symptoms are suspected); lung function based on determining, forced vital capacity (FVC), 1 sec - capacitor (FEV1), FEV1%FVC, MEF50	-
Chemical Name	Denmark – Biological Exposure Limits	Finland – Biological Limit Values	France – Biological Exposure Indices
Cobalt	-	-	0.001 mg/L Medium: blood Time: end of shift at end of workweek Parameter: Cobalt (Background noise on non-exposed subjects,

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			Semi-quantitative (ambiguous interpretation)); 0.015 mg/L Medium: urine Time: end of shift at end of workweek Parameter: Cobalt (Background noise on non-exposed subjects)
<b>Chemical Name</b>	<b>Germany – Biological Threshold</b>	<b>Hungary</b>	<b>Ireland – Biological Monitoring</b>
Cobalt	-	0.03 mg/g Creatinine Medium: urine Time: end of shift Parameter: Cobalt; 0.058 µmol/mmol Creatinine Medium: urine Time: end of shift Parameter: Cobalt	15 µg/L Medium: urine Time: end of shift at end of workweek Parameter: Cobalt (background); 1 µg/L Medium: blood Time: end of shift at end of workweek Parameter: Cobalt (semi-quantitative)
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")	-
Manganese	20 µg/L Medium: whole blood Time: end of shift Parameter: Manganese; 20 µg/L Medium: whole blood Time: end of several shifts Parameter: Manganese (for long-term exposures)	-	-
<b>Chemical Name</b>	<b>Italy – Recommended Biological Exposure Indices (BEI)</b>	<b>Luxembourg – Biological Limit Values and Health Surveillance Measures</b>	<b>Spain – Biological Limit Values</b>
Cobalt	15 µg/L Medium: urine Sampling Time: end of shift at end of workweek Parameter: Cobalt (Background); 1 µg/L Medium: blood Sampling Time: end of shift at end of workweek Parameter: Cobalt (Background, semi-quantitative)	-	15 µg/L urine end of workweek Cobalt (1,F); 1 µg/L blood end of workweek Cobalt (1,F,S)
<b>Chemical Name</b>	<b>Switzerland – Biological Limit Values</b>	<b>United Kingdom – Biological Monitoring</b>	<b>Turkey – Biological Threshold Values</b>
Cobalt	30 µg/L Medium: urine Time: end of shift Parameter: Cobalt	-	-
<b>Chemical Name</b>	<b>South Africa – Biological Exposure Indices</b>	<b>Israel – Biological Markers</b>	<b>USA ACGIH - BEI</b>
Cobalt	-	15 µg/L Medium: urine Time: end of shift at end of workweek Parameter: Cobalt (background); 1 µg/L Medium: blood Time: end of shift at end of workweek Parameter: Cobalt background, semi-quantitative)	15 µg/L Medium: urine Time: end of shift at end of workweek Parameter: Cobalt (background); 1 µg/L Medium: blood Time: end of shift at end of workweek Parameter: Cobalt (background, semi-quantitative)

### Special Precautions for users:

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

to be exceeded or if irritation or other symptoms are experienced, NIOSH/MSHA or EN 136 approved respiratory protection should be worn.

**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

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

<b>Physical state:</b> Solid	<b>Appearance:</b> Metallic
<b>Odour:</b> None	<b>Melting Range:</b> ~ 1400°C / ~ 2552°F
<b>Flash point:</b> N/A	<b>Vapour pressure:</b> N/A
<b>Vapour Density:</b> N/A	<b>Water Solubility:</b> Insoluble in water
<b>Autoignition temperature:</b> N/A	<b>Dynamic viscosity:</b> Solid
<b>Density:</b> 8.1 – 8.4 g/cm <sup>3</sup>	<b>Explosive Properties:</b> Non explosive

## 10. STABILITY AND REACTIVITY

<b>Reactivity:</b>	Stable under normal conditions.
<b>Chemical stability:</b>	Stable under normal conditions.
<b>Possibility of hazardous reactions:</b>	Stable under normal conditions.
<b>Conditions to avoid:</b>	Keep away from sources of heat (e.g. hot surfaces), sparks and open flames.
<b>Incompatible materials:</b>	Acids. Strong oxidising agents.
<b>Hazardous decomposition products:</b>	Thermal decomposition can lead to release of toxic/corrosive gases and vapours.

## 11. TOXICOLOGY INFORMATION

**Information on toxicological effects:**

**Acute toxicity:**

**Inhalation:**

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

**Eye contact:**

Contact with eyes may cause irritation

**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 1B

**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 diarrhoea Ingestion may cause irritation to mucous membranes

**Irritation:**

Repeated exposure may cause skin dryness or cracking.

**Sensitisation:**

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)
Molybdenum	LD50 >2000 mg/kg bw	Not Classified	LC50 >3.92 mg/L air
Silicon Metal	LD50 >3160 mg/kg bw	LD50 >5000 mg/kg bw	Acutely Non Toxic
Manganese	LD50 >2000 mg/kg bw	Data waiving - Study Scientifically Unjustified	LC50 >5.14 mg/L air (analytical)
Iron	= 984 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. Contains a known or suspected reproductive toxin.

**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 listed has listed any ingredient as a carcinogen.

Chemical Name	IARC	EU Annex I Carcinogen Information	Austria - Carcinogens	Belgium – Suspected Carcinogens and Mutagens
Cobalt	Group 2B – Possible Human Carcinogen	-	Group A2 Carcinogen	Present
Chromium	Group 3 – Not classified as a Human Carcinogen	Category 3	-	-
Chemical Name	France - Carcinogens	Germany - Carcinogens	Hungary - Carcinogens	Ireland - Carcinogens
Cobalt	-	Category 2 (considered to be carcinogenic for man) Category 3 (bioavailable, as inhalable dust/aerosol, except hard metals, cobalt containing spinels and organic cobalt desiccants)	-	-
Chemical Name	Italy - Carcinogens	Netherlands - Carcinogens	Norway - Carcinogens	Portugal - Carcinogens
Cobalt	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans	-	-	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
Chromium	A4 - Not Classifiable as a Human Carcinogen	-	-	Present A4 – Not Classifiable as a Human Carcinogen
Chemical Name	Spain - Carcinogens	Sweden - Carcinogens	Switzerland - Carcinogens	UK
Cobalt	-	Carcinogen	Category C2 carcinogen	Capable of causing cancer and/or heritable genetic damage.
Chemical Name	Australia - Carcinogens	New Zealand	Russia - Carcinogens	..

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Cobalt	-	-	Present (with tungsten carbide; Route of exposure: inhalation)	-
<b>Chemical Name</b>	<b>Gulf Coop. Carcinogens</b>	<b>Egypt Carcinogens</b>	<b>South Africa – Carcinogens Compounds</b>	-
Cobalt	Category 2 Carcinogen	Confirmed Human Carcinogen	Animal Carcinogen (dust and fumes as Co)	-
Chromium	Category 1 Carcinogen	Present	-	-

**Mutagenic Effects:** None known.  
**Reproductive toxicity:** Contains a known or suspected reproductive toxin.  
**Development toxicity:** None known.  
**Target organ effects:** Eyes, respiratory system, skin, central nervous system (CNS)  
**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 tremours, impaired speech, mask like face and impaired movement.  
**Other information:** None.

## 12. ECOLOGICAL INFORMATION

**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	Daphnia Magna
Cobalt	EC50 – 270ug/L	NOEC – 100 mg/L – Cobalt Powder	Not available	LOEC – 5.6 mg/L, LC50 > 100 mg/L
Chromium	Date Waiving – Study Scientifically Unjustified	Date Waiving – Study Scientifically unjustified	Not available	Date 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
Silicon Metal	Date Waiving – Study Scientifically Unjustified	Date Waiving – Other Justification	Not available	EC50 > 1.6 mg/L
Iron	NOEC – 1.4 mg/L	Date Waiving – Study Scientifically Unjustified	Not available	Date Waiving – Study Scientifically Unjustified

**Persistence and degradability:**

Product/Substance is inorganic. Not applicable.

**Bioaccumulative potential:**

This substance is not considered to be persistent, bioaccumulating not toxic (PBT).

**Mobility in soil:**

No information available.

**Results of PBT & vPvB assessment:**

The components in this formulation do not meet the criteria for classification as PBT or vPvB.

**Other adverse effects:**

## 13. DISPOSAL CONSIDERATIONS

**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. Dispose of in accordance with local regulations.

**Contaminated packaging:**

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

**EWC Waste Disposal No:**

**Other information:**

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

#### 14. TRANSPORT INFORMATION

<b>IMO/IMDG:</b>	Not regulated
<b>ADR/RID:</b>	Not regulated
<b>ICAO/IATA-DGR:</b>	Not regulated
<b>Australian Dangerous Goods:</b>	Not regulated

#### 15. REGULATORY INFORMATION

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

**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)
Cobalt	ID Number 1443, not considered hazardous to water
Chromium	ID Number 1443, not considered hazardous to water
Molybdenum	ID Number 1443, not considered hazardous to water
Manganese	ID Number 1443, not considered hazardous to water
Iron	ID Number 748, not considered hazardous to water

**International inventories:**

**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 Electrical Equipment	EU REACH (1907/2006) – Article 59(1) – Candidate List of Substances for Eventual Inclusion in Annex XIV	EU REACH Restriction on Certain Dangerous Substances
Cobalt	Nov 30, 2010	2011-02-17	-	-	-
Chromium	Nov 30, 2010	2011-03-17	-	-	-
Molybdenum	Nov 30, 2010	2011-03-17-	-	-	-
Silicon Metal	Nov 30, 2010	2010-12-20	-	-	-
Manganese	Nov 30, 2010	2011-03017	-	-	-
Iron	Nov 30, 2010	2011-03-17	-	-	-

Chemical Name	EU REACH (1907/2006) – Consultations, intentions, proposals
Cobalt	Carc. 1B H350, Repr. 1B H360F according to CLP (Notified by Netherlands)

Chemical Name	Russia Dangerous Substances
Cobalt	Present
Molybdenum	Present
Iron	Present

**16. FURTHER INFORMATION**

The data given above covers exclusively the safety requirements of the product(s) and is based on our current knowledge and experience. It does not signify any warranty with regards to the products properties. This product is only supplied for specific uses in dentistry and must be used in accordance with the directions for use.