

PowderRange

Issue: 08

PowderRange CMMC-F

Date Revised: 14/05/2019

Safety Data Sheet

*** Section 1 - Identification of the Substance/Mixtures and of the Company/Undertaking ***

1.1 Product identifier

Chemical Name: Cobalt Base Powder

Synonyms: Metal Alloy Powder

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

Uses: Metal Powder for Additive Layer Manufacturer or HIP detailing

Not to be used for: Any other purpose

1.3 Details of the supplier of the safety data sheet

Carpenter Additive

Dennis Road,

Widnes,

Cheshire WA8 0GU,

United Kingdom

Tel: +44(0)1925 606 520

E-mail address: SDS@CarpenterAdditive.com

1.4 Emergency telephone number

Acute: 112 (Emergency EU/UK) / 911 (Emergency US)

Non-acute (CHEMTREC): +1 703-527-3887 (from anywhere in the world) / 1-800-424-9300 (within US and Canada)

*** Section 2 - Hazards Identification ***

2.1 Classification of the substance or mixture

May cause sensitization by inhalation and skin contact.

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

Causes damage to organs through prolonged or repeated exposure.

May cause cancer by inhalation

May cause long-term adverse effects in the aquatic environment.

CLP Classification

Skin Sensitiser Category 1 - H317

Respiratory Sensitiser Category 1 - H334

Carcinogen Category 2 - H351

STOT RE Category 1 - H372

Aquatic Chronic Category 3 – H412

For full wording of Hazard statements see Section 16

PowderRange

Issue: 08

PowderRange CMMC-F

Date Revised: 14/05/2019

Safety Data Sheet

2.2 Label Elements

Labelling according to Regulation (EC) No 1272/2008 [CLP]



DANGER

Hazard statements:

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

H372 - Causes damage to organs through prolonged or repeated exposure.

H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements:

P260 - Do not breathe dust.

P280 - Wear protective gloves/protective clothing/eye protection/face protection.

P272 – Contaminated work clothing should not be allowed out of the workplace

P285 - In case of inadequate ventilation wear respiratory protection.

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P333+P313 - If skin irritation or rash occurs: Get medical advice / attention.

Contains: Nickel and Cobalt.

2.3 Other hazards

Dust can irritate the eyes. High dust levels may irritate the respiratory system.

Does not fulfil the criteria for classification as PBT or vPvB.

PowderRange

Issue: 08

PowderRange CMMC-F
Safety Data Sheet

Date Revised: 14/05/2019

*** Section 3 - Composition / Information on Ingredients ***

3.1 Substances

Hazardous component(s)

Under CLP EC 1272/2008

Ingredient	CAS/EC Number	REACH Registration Number	Weight %	CLP Hazard Category	H-Statements
Cobalt	7440-48-4/ 231-158-0	01-2119517392-44	30-60	Respiratory Sensitiser Category 1 Skin Sensitiser Category 1 Aquatic Chronic Category 4 Carcinogen Category 2	H334 H317 H413 H350i
Chromium	7440-47-3/ 231-157-5	01-2119485652-31	<35	Aquatic Chronic Category 4	H413
Molybdenum	7439-98-7 231-105-1	01-2119472304-43	<10	None	None
Nickel	7440-02-0/ 231-111-4	01-2119438727-29	<5	Skin Sensitiser Category 1 Carcinogen Category 2 STOT RE Category 1 Aquatic Chronic Category 3	H317 H351 H372 H412
Iron	7439-89-6/ 231-096-4	01-2119462838-24	<5	None	None

For full wording of H-statements see Section 16.

Subject to exposure limit – See Section 8.

*** Section 4 - First Aid Measures ***

4.1. Description of first aid measures

Inhalation: Remove patient to fresh air, allow to rest and keep warm. If not breathing, give artificial respiration and seek medical attention.

Skin contact: Remove contaminated clothing, shoes and jewellery and wash before reuse. Wash skin with soap and water for several minutes. Get medical attention if symptoms persist.

Eye contact: Rinse with a gentle stream water for at least 15 minutes. Hold eye lids open. Remove any contact lenses. Get medical attention if symptoms persist.

Ingestion: DO NOT induce vomiting! Rinse mouth out and then drink plenty of water. Get medical attention if discomfort occurs.

Personal precautions: Ensure that those giving first aid treatment do not get contaminated by product spills, etc. Wear suitable protective clothing, gloves and eye protection. See also Section 8 for details.

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

May cause allergic skin reaction. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Causes damage to organs through prolonged or repeated exposure. May cause cancer by inhalation.

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

No further data available for this product.

*** Section 5 - Fire Fighting Measures ***

5.1. Extinguishing media

Suitable: Water mist, foam, dry powder.

Not to be used: Water jet – will spread product.

5.2. Special hazards arising from the substance or mixture

Product is not flammable. Fire in the surrounding materials can give rise to toxic fire gases.

High concentration of airborne dust may form explosive mixture with air.

Decomposition of this product may yield metallic oxides.

5.3. Advice for fire fighters

Self-contained breathing apparatus and protective clothing.

Prevent fire fighting water entering watercourses or groundwater.

Avoid creation of dusts.

*** Section 6 - Accidental Release Measures ***

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment, see Section 8. Avoid contact with eyes and skin and inhalation of dust. Use with adequate ventilation.

6.2. Environmental precautions

Prevent from entering sewers or the immediate environment. In case of large spill, inform local police, local authority, water company, appropriate local environmental authority and/or fire brigade as appropriate.

6.3. Methods and material for containment and cleaning up

On soil: Contain any spilled material immediately by vacuuming or shovelling, taking care not to raise dust, into labelled containers for disposal (See Section 13).

On water: None known.

6.4. Reference to other sections

See Section 8 for details of protective equipment.

PowderRange

Issue: 08

PowderRange CCMC-F
Safety Data Sheet

Date Revised: 14/05/2019

See Section 13 for details of disposal.

*** Section 7 - Handling and Storage ***

7.1. Precautions for safe handling

Use personal protective equipment, see Section 8. Avoid creating dust where possible. Ensure good dust ventilation during handling. If necessary, use local exhaust ventilation. Use non-sparking tools when opening or closing containers. Wet mopping or HEPA vacuuming is recommended to clean up any dusts that may be generated during handling and processing. Wash hands and face thoroughly before eating, drinking or smoking.

7.2. Conditions for safe storage, including any incompatibilities

Store indoors. Keep in original containers. Keep dry. Good housekeeping and engineering practices should be employed to prevent the generation and accumulation of dusts.

7.3. Specific end use(s)

PC14 – Metal surface treatment product.

ERC5 - Industrial use resulting in inclusion into or onto a Matrix.

*** Section 8 - Exposure Controls / Personal Protection ***

8.1 Control Parameters

Cobalt (7440-48-4)

TLV: 0.02 mg/m³ as TWA
OSHA: 0.1 mg/m³ TWA (particulate)
NIOSH: 0.05 mg/m³ TWA (particulate)

Chromium (7440-47-3)

TLV: 0.5 mg/m³ as TWA
OSHA: 1 mg/m³ TWA (particulate)
NIOSH: 0.5 mg/m³ TWA (particulate)

Nickel (7440-02-0)

TLV: 1.5 mg/m³ as TWA (inhalable fraction)
OSHA: 1 mg/m³ TWA (particulate)

Monitoring procedures: None specified

8.2. Exposure Controls

Recommended engineering controls: Ensure good ventilation, where possible at local site of dust formation. Arrange for eye wash possibility.

Personal protection:

Always check applicability with your supplier of protective equipment.

PowderRange

Issue: 08

PowderRange CMMC-F
Safety Data Sheet

Date Revised: 14/05/2019

Respiratory protection: Personal exposure must be controlled to conform with local/national regulations (see above). If this is not possible, respiratory protection must be worn. Full face respirator conforming to EN143, Type P3 should be used.

Skin protection: Chemically resistant protective overalls.

Eye protection: Wear safety glasses or goggles.

Hand protection: Always wear gloves when handling the product. Contact your supplier of protective equipment for more details. Note: Break-through times can vary depending on thickness, use and source. Change gloves regularly.

General hygiene: Do not eat, drink, or smoke while using this product. Immediately take off any contaminated clothing and launder before re-use. Wash hands and / or face before breaks and at the end of the shift. After the session, wash the skin and apply skin cream.

*** Section 9 - Physical & Chemical Properties ***

9.1 Information on basic physical and chemical properties

Appearance:	Grey metallic powder < 1.0mm	Odor:	None
Odor Threshold Value:	None	pH:	Not Available
Melting Point (°C):	Not Available	Boiling Point :	Not Available
Flash Point:	Not Available	Evaporation Rate:	Not Applicable
Flammability:	Not a flammable solid	Upper Flammability Limit (UFL):	Not Available
Vapor Pressure:	Not Available	Vapor Density:	Not Available
Density (g/cm³):	Not Available	Solubility (H₂O):	Insoluble
Partition coefficient:	Not Applicable	Auto-ignition temperature:	Not Available
Decomposition temperature:	Not Available	Viscosity:	Not Available
Explosive properties:	Not Available	Oxidising properties:	Not Available

9.2 Other Information

These are typical values and do not constitute a specification.

*** Section 10 - Stability & Reactivity ***

10.1. Reactivity

Stable product under recommended storage and handling conditions.

10.2. Chemical stability

Stable product under recommended storage and handling conditions.

10.3. Possibility of hazardous reactions

Stable product under recommended storage and handling conditions.

10.4. Conditions to avoid

High temperatures and humid conditions can cause oxide formation and / or rust on the particle surfaces.

PowderRange

Issue: 08

PowderRange CMMC-F

Date Revised: 14/05/2019

Safety Data Sheet

10.5. Incompatible materials

Contact with water can cause oxide formation and / or rust on the particle surfaces. Avoid accidental contact with strong acidic or alkaline solutions.

10.6. Hazardous decomposition products

None known.

*** Section 11 - Toxicological Information ***

11.1 Potential Health Effects

A: General Product Information

Inhalation of metal fumes may cause metal fume fever, a flu-like illness generally lasting 24 hours or less.

Cobalt: Prolonged and/or repeated contact may cause irritation and/or dermatitis. May cause skin sensitization. Repeated exposure may cause allergic respiratory reaction (asthma). Ingestion may cause gastrointestinal irritation with nausea, vomiting and diarrhea. Effects of overexposure to cobalt include lung effects (irritation, fibrosis, asthma), cardiovascular effects (cardiomyopathy), liver and kidney congestion.

Chromium: Industrial exposure to chromium may cause dermatitis, skin ulcers, perforation of the nasal septum, as well as cancers of the lungs, nasal cavity and paranasal sinuses.

Nickel: Systemic effects from ingestion of nickel salts include capillary damage, kidney damage, myocardial weakness and central nervous system depression. Allergic skin sensitization reactions are the most frequent effect of exposure to nickel compounds. Contact with nickel compounds may also result in allergic lung sensitization reactions. Nickel is a possible human carcinogen.

Iron: Chronic inhalation of iron has resulted in mottling of the lungs, a condition referred to as siderosis. This is considered benign pneumoconiosis and does not ordinarily cause significant physiologic impairment.

B: Substance Analysis - LD50/LC50

Cobalt (7440-48-4)

Oral LD50 Rat: 6171 mg/kg

Chromium (7440-47-3)

LD50 Rat: 27.5 mg/kg

Nickel (7440-02-0)

Oral LD50 Rat: >5000 mg/kg

Iron (7439-89-6)

Oral LD50 Rat: 30000 mg/kg

PowderRange

Issue: 08

PowderRange CMMC-F
Safety Data Sheet

Date Revised: 14/05/2019

11.2 Carcinogenicity

A: General Product Information

No carcinogenicity data available for this product. The carcinogenic effect of nickel has been well documented in occupationally exposed nickel refinery workers. Lung and nasal cancers were the predominant forms of cancer in the exposed workers. In experimental animal's injection of nickel produced injection site tumors although some of these tumors metastasized. Upon inhalation of nickel, lymphosarcomas were observed in mice and aveolar carcinomas in guinea pigs. Cobalt is a confirmed animal carcinogen.

B: Substance Carcinogenicity

Cobalt (231-158-0)

IARC: Monograph
86 [2006] (without tungsten carbide), Monograph 52 [1991] (Group 2B (possibly carcinogenic to humans))

Chromium (231-157-5)

IARC: Monograph 49 [1990] (listed under Chromium and Chromium compounds),
Supplement 7 [1987] (Group 3 (not classifiable))

Nickel (231-111-4)

IARC: Monograph 49 [1990], Supplement 7 [1987] (Group 2B (possibly carcinogenic to humans))

11.3 Other Toxicological Information

Exposure to metal dusts and oxides may cause metal fume fever. Metal fume fever is a temporary flu-like condition characterized by chills, fever, muscle aches and pains, nausea and vomiting. Typically the symptoms appear within a few hours after exposure and subside within 2-3 days with no permanent effects.

Asthma induced by occupational exposure to nickel and cobalt has been documented. The asthma can result from either primary irritation or from an allergic response. Contact dermatitis in workers exposed to nickel compounds is one of the most prevalent effects of nickel exposure.

*** Section 12 - Ecological Information ***

No data available on mixture. Data based on individual components shown below. Based upon component, product may be toxic to aquatic life.

12.1 Toxicity

Cobalt (231-158-0)

Test & Species

96 Hr LC50 Brachydanio rerio:	>100 mg/L
48 Hr EC50 Invertebrate, Daphnia magna:	3.2 mg/L
72 Hr IC50 Algae, Selenastrum capricornutum:	0.05 – 0.26 mg/L

Conditions

static

PowderRange

Issue: 08

Date Revised: 14/05/2019

PowderRange CMMC-F Safety Data Sheet

Nickel (231-111-4)

Test & Species

96 Hr LC50 Oncorhynchus mykiss:	31.7 mg/L
96 Hr LC50 Pimephales promelas:	3.1 mg/L
96 Hr LC50 Brachydanio rerio:	>100 mg/L
72 Hr EC50 freshwater algae (4 species):	0.1 mg/L
72 Hr EC50 Selenastrum capricornutum:	0.18 mg/L
96 Hr EC50 water flea:	510 µg/L

Conditions

adult

Iron (231-096-4)

Test & Species

96 Hr LC50 Morone saxatilis:	13.6 mg/L
------------------------------	-----------

Conditions

static

12.2 Persistence & Degradability

May cause long-term adverse effects in the aquatic environment.

12.3 Bioaccumulative potential

Not expected to occur.

12.4 Mobility in soil

No information available for the product.

12.5 Results of PBT and vPvB assessment

Does not fulfill the criteria for classification as PBT or vPvB.

12.6 Other adverse effects

No information available for the product.

*** Section 13 - Disposal Considerations ***

13.1 Waste treatment methods

Disposal of product: Waste product is considered Hazardous Waste and should be disposed of via a licensed operator.

Disposal of packaging: Contaminated packing should be disposed of as Hazardous waste according to local authority guidelines.

*** Section 14 - Transport Information ***

Not classified as dangerous for transport

14.1. UN number

Not applicable

PowderRange

Issue: 08

PowderRange CMMC-F
Safety Data Sheet

Date Revised: 14/05/2019

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

None

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

*** Section 15 - Regulatory Information ***

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

Chemical Agents Directive 98/24/EC

15.2. Chemical Safety Assessment

A Chemical Safety Assessment has not been carried out on this mixture.

*** Section 16 - Other Information ***

Sources of data used in this MSDS:

In-house data files, CLP Annex VI Tables 3.1 & 3.2, TOXNET, IARC, International Labour Organization, NIOSH Pocket Guide to Chemical Hazards, European Chemicals Agency, Institute for Health and Consumer Protection.

H-statements used in document:

- 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
- H372: Causes damage to organs through prolonged or repeated exposure
- H412: Harmful to aquatic life with long lasting effects.

PowderRange

Issue: 08

PowderRange CMMC-F

Date Revised: 14/05/2019

Safety Data Sheet

Key/Legend:

EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; LC50 = Lethal Concentration 50%; LD50 = Lethal Dose 50%; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NIOSH = The National Institute for Occupational Safety and Health; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

The information provided on this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. Although reasonable care has been taken in the preparation of this document to assess and summarise the hazard properties of the product, the user must satisfy himself that the information contained herein is pertinent to permit safe handling under his use conditions, since the supplier cannot foresee all conditions of use.