

Safety Data Sheet

CMG Tech-X Inconel 718 Filament



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Version number: 1.0

SECTION 1: Identification of the substance/mixture and company/undertaking

1.1 Product identifier	CMG Tech-X Inconel 718 Filament
1.2 Relevant identified uses of the substance or mixture and uses advised against	Metal filament for 3D printing fabrication. Uses advised against: not available.
1.3 Details of the supplier of the safety data sheet	CMG Technologies Ltd, Building I1, Thompson Drive, Base Business Park, Rendlesham IP12 2TZ, United Kingdom. Tel: +44 (0) 1394 445 100; email: obatka@cmgtechnologies.co.uk; www.cmgtechnologies.co.uk
1.4 Emergency telephone number	Tel +44 (0) 1394 445 100 (UK business hours). UK: 111 (public NHS number for less urgent medical problems). Medical professionals can contact the National Poisons Information Service (NPIS): 0344 892 0111.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to CLP Regulation (1272/2008)

Skin Sens 1, H317; Carc 1B, H350; Repr 1B, H360F; STOT RE 1, H372 (inhalation, respiratory tract); Aquatic Chronic 3, H412.

See Section 16 'Other information' for full text of the H-statements.

2.2 Label elements



Signal word

Danger.

Hazard statements

May cause an allergic skin reaction.
May cause cancer.
May damage fertility.
Causes damage to organs (respiratory tract) through prolonged or repeated exposure via inhalation.
Harmful to aquatic life with long lasting effects.

Precautionary statements

general

Keep out of reach of children.

prevention

Do not breathe dust/vapours.
Wear protective gloves/clothing.

response

Get medical attention if you feel unwell.

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	If skin irritation or rash occurs: Get medical attention.
storage	None.
disposal	Dispose of contents/container in accordance with local/national regulation.
Supplemental information	Not available.

2.3 Other hazards

Product contains nickel and cobalt powder with the potential to cause harm as stated. The metal powders are mixed in a polymer, thus reducing exposure to nickel and cobalt and the potential for harm.

The product does not contain any ingredient identified as having endocrine disrupting properties.

SECTION 3: Composition/information on ingredients

3.2 Mixtures ^{a,b}

Declarable components	Conc. (wt%)	EC No.	CAS No.	REACH Reg. No.	Classification, supplemental hazards, ATE, M-factor, and SCL
Nickel	Ca. 50	231-111-4	7440-02-0	NA	Skin Sens 1, H317; Carc 2, H351; STOT RE 1, H372 (inhalation, respiratory tract); Aquatic Chronic 3, H412
Cobalt	0.1-1	231-158-0	7440-48-4	NA	Acute Tox 4, H302; Skin Sens 1, H317; Resp Sens 1B, H334; Muta 2, H341; Carc 1B, H350; Repr 1B, H360F; Aquatic Acute 1, H400 (M = 10); Aquatic Chronic 2, H411 (M = 1)
<i>Other components</i>					
Chromium	10-25	231-157-5	7440-47-3	NA	Not classified

^a NA: not available.

^b See Section 16 'Other information' for full text of the H-statements.

SECTION 4: First aid measures

4.1 Description of first aid measures

Inhalation	For symptoms of inhalation, eg coughing, breathing difficulty, or respiratory irritation, remove exposed person to fresh air and keep warm and at rest in a position comfortable for breathing. Get medical help if symptoms persist.
Skin	For skin contamination, remove contaminated clothing and wash affected area with soap and water. If irritation, rash, or other symptom occurs, get medical help. Wash contaminated clothing before re-use.
Eye	If product or dust or vapour cause irritation, irrigate affected eye with room-temperature water or eyewash solution for several minutes, occasionally lifting eyelids. Remove any contact lenses if easy to do. Continue rinsing. Get medical help if irritation persists.

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Ingestion	If in mouth, rinse mouth thoroughly with water and spit out rinsings. Water may be given to drink if product has been swallowed. If patient feels unwell or is concerned, get medical help. Do not induce vomiting, unless instructed by medical personnel.
4.2 Most important symptoms and effects, both acute and delayed	May cause an allergic skin reaction. Causes damage to organs (respiratory tract) through prolonged or repeated exposure via inhalation. May cause cancer. May damage fertility. Contains small amounts (< 1%) of a respiratory sensitising substance: cobalt. May cause allergy, asthma symptoms or breathing difficulties if inhaled by individuals sensitive to this substance. Product contains nickel and cobalt powder with the potential to cause harm as stated. The metal powders are mixed in a polymer, thus reducing exposure to nickel and cobalt and the potential for harm.
4.3 Indication of any immediate medical attention and special treatment needed	Treat symptoms as they occur.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable	In case of fire, use extinguishing powder, sand, or water spray.
Unsuitable	Not available.

5.2 Special hazards arising from the substance or mixture The product is not classified as flammable, but will decompose if involved in a fire, producing smoke, and hazardous fumes and gases.

5.3 Advice for firefighters Remove containers from fire or cool them with water spray. For larger fires, firefighters should wear breathing apparatus and protective clothing.

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures	The product is supplied in small containers as coiled filament on a roll, which can be collected. In a professional setting, wear personal protection. Ventilate area. Avoid creating airborne dust. Follow prescribed procedures for responding to spills.
6.2 Environmental precautions	Prevent product from entering water courses or drainage system.
6.3 Methods and material for containment and cleaning up	Clean up spill as soon as possible. For small quantities, collect pieces, and wash off any residue with detergent and water. For large quantities, carefully sweep up, preventing formation of airborne dust, or collect using vacuum cleaner equipped with air filtration. Collect spill, contaminated materials, and washings in a container for disposal.

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6.4 Reference to other sections For recommended personal protective equipment, see Section 8.
For disposal considerations, see Section 13.

SECTION 7: Handling and storage

- 7.1 Precautions for safe handling** Do not handle until all safety precautions have been read and understood. Avoid skin and eye contact with the product, and inhalation of vapours or dust. Use only in a well-ventilated area. See Section 8 for engineering controls and personal protection.
Wash hands after use. Do not eat, drink or smoke when using this product.
Upon mechanical (eg cutting, grinding or polishing), thermal, or chemical treatment the product can release hazardous dust. Do not inhale dusts when formed. Avoid generating airborne dust and keep work areas clean. Dust in sufficient concentration can result in an explosive mixture in air. Eliminate open flame and other sources of ignition.
- 7.2 Conditions for safe storage, including any incompatibilities** Keep packages in a cool, dry place away from direct sunlight. Keep out of reach of children.
- 7.3 Specific end use(s)** Metal filament for 3D printing fabrication.
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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

EU limit values	None.
National limit values	UK: Nickel and water-insoluble nickel compounds (as Ni): WEL: 8 h TWA 0.5 mg/m ³ . Cobalt and Cobalt compounds (as Co): WEL: 8 h TWA 0.1 mg/m ³ . Chromium: WELs: long-term exposure limit (8 h TWA) 0.5 mg/m ³ .
Monitoring procedure	BS EN 14042:2003; Workplace Atmospheres; Guide for the Application and Use of Procedures for the Assessment of Exposure to Chemical and Biological Agents, or specific national equivalent.
Other: human health (DNELs, DMELs)	Nickel: DNELs: workers, long-term exposure, systemic effects, inhalation, 0.05 mg/m ³ ; workers, long-term exposure, local effects, inhalation, 0.05 mg/m ³ ; workers, short-term exposure, local effects, inhalation, 11.9 mg/m ³ . Chromium: DNELs: workers, long-term exposure, local effects, inhalation, 0.5 mg/m ³ . Cobalt: DNELs: workers, long-term exposure, systemic effects, inhalation, 0.05 mg/m ³ ; workers, long-term exposure, local effects, inhalation, 0.04 mg/m ³ ; workers, long-term exposure, systemic effects, dermal, 7.2 mg/kg/day.
Other: environmental (PNEC)	Nickel: PNECs: freshwater, 0.0061 mg/L; sewage treatment plant, 0.33 mg/L; freshwater sediment, 109 mg/kg dry sediment; soil, 39.3 mg/kg dry soil; oral, 0.12 mg/kg food.

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Chromium: PNECs: freshwater, 0.0065 mg/L; freshwater sediment, 206 mg/kg dry sediment; soil, 21.1 mg/kg dry soil; oral, 0.12 mg/kg food.

Cobalt: PNECs: freshwater, 0.001 mg/L; sewage treatment plant, 0.37 mg/L; freshwater sediment, 18.8 mg/kg dry sediment; soil, 10.9 mg/kg dry soil.

8.2 Exposure controls

Engineering controls

Use in a well-ventilated area (3 to 5 air changes/hour) is recommended. For bulk use, and for processing causing formation of dust or fumes, local exhaust ventilation is recommended.

Inhalation of nickel- or cobalt-containing dust and powder should be kept as low as reasonably practicable. See: Exposure to Metal Powders in Additive Manufacturing; Health and Safety Executive; RR1195 (2023).

Personal protective equipment

The need for personal protective equipment should be based on a workplace risk assessment for the particular use.

Avoid skin and eye contact by wearing chemical resistant gloves (eg EN374, EN 420; nitrile rubber gloves, 0.2 mm) and eye protection (EN166). Where more extensive contact may occur, wear protective clothing (eg apron, overalls).

Additional protection from burns may be required for hot processing.

A dust mask (EN 143) may be required if the processing causes dust. For guidance on respiratory protection see HSE Guide HSG53 and BS4275.

PPE should conform to British (EN) standards, or national equivalent.

Consult PPE manufacturers concerning breakthrough times.

Environmental exposure controls

Not available.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

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| (a) Physical state | Coiled filament on a roll |
| (b) Colour | Grey or dark grey |
| (c) Odour | Odourless |
| (d) Melting/freezing point | 120 to 160 °C |
| (e) Boiling point or initial boiling point and boiling range | Not available |
| (f) Flammability | Not classified as flammable |
| (g) Lower and upper explosion limit | Not available |
| (h) Flash point | Not available |
| (i) Auto-ignition temp. | Not available |
| (j) Decomposition temp. | Not available |
| (k) pH | Not available |

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(l) Kinematic viscosity	Not applicable to solid
(m) Solubility	Not soluble in water
(n) Partition coeff. n-octanol/water (log value)	Not available
(o) Vapour pressure	Not available
(p) Density or rel. density	Metal components: 4 to 6
(q) Relative vapour density	Not available
(r) Particle characteristics	Filament of 1.75 or 2.85 mm diameter
9.2 Other information	No ingredient classified as explosive or oxidising.

SECTION 10: Stability and reactivity

10.1 Reactivity	Not available.
10.2 Chemical stability	Stable.
10.3 Possibility of hazardous reactions	Not available
10.4 Conditions to avoid	Open flames, strong heat
10.5 Incompatible materials	Strong oxidizing agents (eg hydrogen peroxide), strong acids, alkalis.
10.6 Hazardous decomposition products	Not available.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

(a) Acute toxicity	Based on available data on the ingredients, the classification criteria are not met for the oral, dermal or inhalation routes of exposure. ATE _{mix} (oral) > 2000 mg/kg; ATE _{mix} (dermal) > 2000 mg/kg; ATE _{mix} (inhalation, mist) > 5 mg/L.
(b) Skin corrosion/irritation	Based on available data on the ingredients, the classification criteria are not met.
(c) Serious eye damage/irritation	Based on available data on the ingredients, the classification criteria are not met.
(d) Respiratory or skin sensitisation	Respiratory sensitisation: contains small amounts (< 1%) of a respiratory sensitising substance: cobalt. May cause allergy, asthma symptoms or breathing difficulties if inhaled by individuals sensitive to this substance. Skin sensitisation: based on available data on the ingredients, the classification criteria are met for Skin Sensitisation Category 1 (may cause an allergic skin reaction). Nickel: well known as a skin sensitizer in humans. The nickel (2+) ion is exclusively responsible for the immunological effects.

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(e) Germ cell mutagenicity	Based on available data on the ingredients, the classification criteria are not met. Cobalt: suspected of causing genetic defects.
(f) Carcinogenicity	Based on available data on the ingredients, the classification criteria are met for Category 1B (may cause cancer.). Cobalt: may cause cancer. Nickel: classified as a Category 2 carcinogen in the CLP Regulation, Annex VI. Nickel metal has tested negative for respiratory carcinogenicity in human studies, and also in an animal inhalation study. An oral carcinogenicity study (2 year; gavage; rat) on nickel sulphate was negative for carcinogenicity.
(g) Reproductive toxicity	Based on available data on the ingredients, the classification criteria are met for Category 1B (may damage fertility). Cobalt: may damage fertility.
(h) STOT-single exposure	Based on available data on the ingredients, the classification criteria are not met. No relevant ingredient has been classified for this effect.
(i) STOT-repeated exposure	Based on available data on the ingredients, the classification criteria are met for Category 1 (causes damage to organs through prolonged or repeated exposure). Nickel: classified in Category 1 in the CLP Regulation, Annex VI. Supplier classification indicates the specific concern for inhalation of nickel causing harm to the respiratory tract. A 2-year inhalation carcinogenicity study concluded that the lowest-observed-adverse-effect concentration (LOAEC) for respiratory effects for nickel powder (MMAD = 1.8 μm , GSD=2.4) was 0.1 mg/m^3 .
(j) Aspiration hazard	Based on available data on the ingredients, the classification criteria are not met.
11.2 Information on other hazards	Product contains nickel and cobalt powder with the potential to cause harm as stated. The metal powder is mixed in a polymer, thus reducing exposure to nickel and cobalt and the potential for harm. No ingredient has been classified with endocrine disrupting properties relevant for humans.

SECTION 12: Ecological information

12.1 Toxicity	Based on available data on the ingredients, the classification criteria are met for Aquatic Chronic Category 3 (harmful to aquatic life with long lasting effects). Nickel: LC ₅₀ (freshwater fish, 96 h) 0.0004 to 0.32 mg/L; LC ₅₀ (invertebrate, 48 h) 0.013 to 5.0 mg/L; EC ₁₀ (freshwater algae), 0.0035 to 0.90 mg/L. Cobalt: LC ₅₀ (freshwater fish, 96 h) 0.8 to 85 mg/L; LC ₅₀ (invertebrate, 48 h) 0.39 to 7219 mg/L; EC ₅₀ (freshwater algae), 0.095 to 0.486 mg/L, EC ₁₀ (freshwater algae), 0.022 to 0.297 mg/L.
12.2 Persistence and degradability	Product comprises of metal powders in a polymer, and is expected to persist in the environment.

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12.3 Bioaccumulative potential	Bioaccumulation not applicable to metals.
12.4 Mobility in soil	Not available.
12.5 Results of PBT and vPvB assessment	PBT or vPvB assessment not applicable to metals.
12.6 Endocrine disrupting properties	No ingredient has been classified with endocrine disrupting properties relevant for the environment.
12.7 Other adverse effects	The mixture is not classified as hazardous to the ozone layer.

SECTION 13: Disposal considerations

13.1 Waste treatment methods	<p>Product comprises metal powders in a polymer. Recycling is recommended for bulk disposal of this product. Landfill or disposal via the drains is not recommended.</p> <p>Disposal must be in accordance with national and local regulations. Chemical residues generally count as special waste. General EU requirements are given in Directive 2008/98/EC.</p>
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SECTION 14: Transport information

14.1 UN Number	Not classified as dangerous goods for transport.
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 classified as marine pollutant/environmentally hazardous.
14.6 Special precautions for user	Not available.
14.7 Maritime transport in bulk according to IMO instruments	Not applicable. This product is not intended to be transported by sea in bulk containers.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture	<p><i>UK:</i> Control of Substances Hazardous to Health Regulations 2002 (COSHH), as amended.</p> <p>COSHH Essentials: Easy Steps to Control Chemicals; HSE Books 2003 (also available on the HSE web site).</p> <p>Workplace Exposure Limits EH40/2005 (Fourth Edition, 2020); Health and Safety Executive.</p>
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15.2 Chemical safety assessment Not available.

SECTION 16: Other information

Revisions	This SDS is the first version in EU format (Regulation 2020/878), using classification according to the CLP Regulation (1272/2008).
Abbreviations	ATE, acute toxicity estimate; DNEL, derived no-effect level; DMEL, derived minimum effect level; EC, effect concentration; GSD, geometric standard deviation; LC, lethal concentration; LD, lethal dose; LOAEC, lowest-observed-adverse-effect concentration; MMAD, mass median aerodynamic diameter; NOAEC, no-observed-adverse-effect concentration; PBT, persistent, bioaccumulative, and toxic; PNEC, predicted no-effect concentration; SCL, specific concentration limit; STOT RE, specific target organ toxicity repeated exposure; STOT SE, specific target organ toxicity single exposure; TWA, time-weighted average; vPvB, very persistent, very bioaccumulative; WEL, UK workplace exposure limit.
References	Search for chemicals; available at the European Chemicals Agency website: http://echa.europa.eu/ .
Basis of classification	The mixture is self-classified from available information on the ingredients.
List of hazard statements	H302: Harmful if swallowed; H317: May cause an allergic skin reaction; H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled; H341: Suspected of causing genetic defects; H350: May cause cancer; H351: Suspected of causing cancer; H360F: May damage fertility; H372: Causes damage to organs through prolonged or repeated exposure; H400: Very toxic to aquatic life; H411: Toxic to aquatic life with long lasting effects; H412: Harmful to aquatic life with long lasting effects.