

Product CoCr RM1
 Revision Date 10/17/2016
 Revision 1



Safety Data Sheet (SDS)

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product Name	CoCr RM1
Synonyms, Trade Names	No information available.
Identified Uses	Manufacturing of dental prosthesis in a dental laboratory.
Supplier	Renishaw plc Brooms Road Stone Business Park Stone, Staffordshire ST15 0SH United Kingdom Tel: +44 (0) 1785 285000 (during UK office hours 09:00 to 17:00 UTC).
Contact Person	msds@renishaw.com
Emergency Telephone	999 / 911 or local emergency number.

SECTION 2: HAZARDS IDENTIFICATION

Appearance	Powder.
Color	Grey.
Odor	Odourless.

Pictogram(s)



Signal Word

Danger

Hazard Statements

H302 Harmful if swallowed.
 H319 Causes serious eye irritation.
 H330 Fatal if inhaled.
 H350 May cause cancer .
 H360 May damage fertility or the unborn child .
 H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements

Prevention
 P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P260 Do not breathe dust/fume/ gas/mist/vapours/spray.
 P264 Wash hands thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P271 Use only outdoors or in a well-ventilated area.
 P273 Avoid release to the environment.
 P280 Wear protective gloves/ protective clothing/eye protection/face protection.
 P281 Use personal protective equipment as required.
 P284 Wear respiratory protection.
 Response
 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. P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P308 + P313 IF exposed or concerned: Get medical advice/ attention. P310 Immediately call a POISON CENTER or doctor/physician P330 Rinse mouth. P337 + P313 If eye irritation persists: Get medical advice/attention P391 Collect spillage. Storage P403 + P233 Store in a well-ventilated place. Keep container tightly closed. P405 Store locked up.
Contains	Cobalt
GHS Classification	
Physical and Chemical Hazards	Not classified
Human Health	Acute Tox 4 - H302, Acute Tox 1 - H330, Eye Irrit.2A - H319, Carc. 1B - H350, Repr. 1B- H360
Environment	Aquatic Acute 1 - H400, Aquatic Chronic 1 - H410
OSHA Regulatory Status	This product is Hazardous under the OSHA Hazard communication Standard.
Inhalation	Harmful if inhaled. May cause breathing difficulties if inhaled. High dust levels may irritate the respiratory system.
Ingestion	Harmful if swallowed. Can cause irritation of the gastrointestinal tract.
Skin Contact	Can cause mechanical irritation, abrasion or allergic skin reaction.
Eye Contact	Dust can cause mechanical irritation.
Routes of Exposure	No information available.
Other Hazards	Dust clouds may be explosive.
	Dust can irritate the eyes. High dust levels may irritate the respiratory system.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Name	Product Identifier	GHS Classification	%
Cobalt	CAS-No.: 7440-48-4 EC No.: 231-158-0	Acute Tox 4 - H302, Acute Tox 1 - H330, Eye Irrit.2A - H319, Carc. 1B - H350, Repr. 1B- H360, Aquatic Acute 1 - H400, Aquatic Chronic 1 - H410	30-60%
chromium	CAS-No.: 7440-47-3 EC No.: 231-157-5		10-30%
palladium	CAS-No.: 7440-05-3 EC No.: 231-115-6		10-30%
tungsten	CAS-No.: 7440-33-7 EC No.: 231-143-9	Flam. Sol 1- H228, Self-heat. 2- H252	1-10%
silicon	CAS-No.: 7440-21-3 EC No.: 231-130-8		1-10%

Composition Comments	No additional information available.
----------------------	--------------------------------------

SECTION 4: FIRST AID MEASURES

Description of First Aid Measures

General Information	Provide general first aid, rest, warmth and fresh air. As a general rule, in case of doubt or if symptoms persist, always call a doctor. Seek medical attention for all burns and eye injuries, regardless how minor they may seem. First aid personnel must be aware of own risk during rescue. In case of allergic symptoms, especially respiratory tract related, seek medical help immediately.
Inhalation	Remove patient to fresh air, allow to rest and keep warm. If breathing is difficult, provide oxygen. Immediately call a physician. If not breathing, give artificial respiration and seek medical attention.
Ingestion	Ingestion: DO NOT induce vomiting! Rinse mouth thoroughly. Obtain medical attention immediately.
Skin Contact	Remove contaminated clothing, shoes and jewelry and wash before reuse. Wash skin with soap and water for several minutes. Get medical attention if symptoms persist.

Eye Contact	Eye contact: Do not rub eye. Avoid contaminating unaffected eye. Make sure to remove any contact lenses from the eyes. Rinse with a gentle stream water for at least 15 minutes. Hold eye lids open. Get medical attention immediately.
-------------	---

Most Important Symptoms and Effects, Both Acute and Delayed

General Information	The severity of the symptoms described will vary dependent on the concentration and the length of exposure.
Inhalation	Harmful if inhaled. May cause breathing difficulties if inhaled. High dust levels may irritate the respiratory system.
Ingestion	Harmful if swallowed. Can cause irritation of the gastrointestinal tract.
Skin Contact	Can cause mechanical irritation, abrasion or allergic skin reaction.
Eye Contact	Dust can cause mechanical irritation.
Routes of Exposure	No information available.

Most Important Symptoms and Effects, Both Acute and Delayed

Notes To The Physician	Treat symptomatically.
------------------------	------------------------

SECTION 5: FIRE-FIGHTING MEASURES

Auto Ignition Temperature (°C)	No information available.
Flammability Limit - Lower(%)	No information available.
Flammability Limit - Upper(%)	No information available.
Flash Point	No information available.
Extinguishing Media	Use gentle surface application of Class D extinguishing agent or dry inert granular material (e.g., sand) to cover and ring the burning material. Use ONLY Class D – Dry Powder - extinguishers with spin applicators for smother effect application.
Hazardous Combustion Products	Decomposition of this product may yield metallic oxides.
Unusual Fire & Explosion Hazards	Dust clouds may be explosive.
Special Fire Fighting Procedures	If possible, fight fire from protected position. Avoid breathing fire vapours. Keep up-wind to avoid fumes. Ventilate closed spaces before entering them. Gently smother burning material with dry sand or other inert substance, or special powder (Class D – Dry Powder) extinguishers with spin applicator. Gently cover and ring the burning material. Avoid mixing of the extinguishing agent with the burning material. Apply extinguishing media carefully to avoid creating airborne dust. Do not disturb the material until completely cool.
Protective Equipment for Firefighters	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to MSHA/NIOSH standards will provide a basic level of protection for chemical incidents. (See also NFPA 1971/NFPA 1851.)

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions	Read and follow manufacturer's recommendations. Do not touch or walk through spilled material. If necessary evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Wear protective clothing as described in Section 8 of this safety data sheet. Avoid inhalation of vapours and contact with skin and eyes. Provide adequate ventilation. In case of inadequate ventilation, use respiratory protection. Do not smoke, eat or drink while using this product. Eliminate all sources of ignition.
For Emergency Responders	Follow safe handling advice and personal protective equipment recommendations for normal use of product.
Environmental Precautions	Prevent from entering sewers or the immediate environment.
Spill Clean Up Methods	Restrict non-essential personnel from the area. In case of spills, beware of slippery floors and surfaces. Eliminate all ignition sources. Evacuate area. Use dry cleanup procedures. Collect any spilled material immediately by vacuuming or shoveling - use non sparking tools or equipment/natural bristle brushes. Take care not to raise dust. Place in labelled, dry, water-tight containers. If using vacuum suction equipment ensure that it is suitable for use with ignitable dusts.

SECTION 7: HANDLING AND STORAGE

Handling	Ensure good dust ventilation during handling. If necessary, use local exhaust ventilation. Use non-sparking tools when opening or closing containers. Avoid sources of sparks or other sources of ignition i.e. no grinding - naked flames - smoking etc. Protect against static electricity. HEPA vacuuming is recommended to clean up any dusts that may be generated during handling and processing. Use personal protective equipment, see Section 8. Avoid generation of dust clouds. Wash hands and face thoroughly before eating, drinking or smoking. Maintain a supply of "coarse" (rock-type) salt and/or "Class D" (for metal fires) fire extinguisher located near processing and storage areas. Avoid prolonged or repeated contact. Pregnant or breastfeeding women must not handle this product
Usage Description	Use only according to directions.
Storage Precautions	Keep locked up and out of reach of children. Avoid contact with incompatible materials, static, moisture, and flames. Keep away from heat, sparks and open flame. Store in tightly closed original container in a cool, dry and well-ventilated place. Good housekeeping and engineering practices should be employed to prevent the generation and accumulation of dusts.
Specific End Use(s)	The identified uses for this product are detailed in Section 1.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment



Component	STD	TWA (8 Hrs)		STEL (15mins)		Notes
chromium	NIOSH		0.5mg/m3			chromium metal and chromium(II) and chromium(III) compounds.
chromium	WEL		0.5mg/m3			Chromium and Cr(II); Cr(III) compounds.
tungsten	NIOSH		5mg/m3		10mg/m3	Tungsten & insoluble compounds (as W).
tungsten	NIOSH		1mg/m3		3mg/m3	Tungsten & soluble compounds (as W).
tungsten	WEL		5mg/m3		10mg/m3	Tungsten & insoluble compounds (as W).
tungsten	WEL		1mg/m3		3mg/m3	Tungsten & soluble compounds (as W).
silicon	NIOSH		10mg/m3			Total dust.
silicon	NIOSH		5mg/m3			Respirable fraction.
silicon	WEL		10mg/m3			Inhalable aerosol.
silicon	WEL		4mg/m3			Respirable aerosol.

Ingredient Comments	Workplace Exposure Limits Guidance Note EH40/2005. The National Institute for Occupational Safety and Health (NIOSH).
Process Conditions	Ensure that eye flushing systems are located close by in the work place.
Engineering Measures	Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Use with adequate explosion-proof ventilation designed to handle metal particulates.
Respiratory Equipment	A NIOSH approved dust mask or filtering facepiece is recommended in poorly ventilated areas or when permissible exposure limits may be exceeded. Respirators should be selected by and used under the direction of a trained health and safety professional following requirements found in OSHA's respirator standard (29 CFR 1910.134). If the respirator is the sole means of protection, use a full-face supplied air respirator. Change filters frequently.
Hand Protection	Use suitable protective gloves if there is a risk of skin contact. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good

	laboratory practices. Change gloves regularly. Suggested material: PVC. Butyl rubber. Neoprene. Consult manufacturer for specific advice on material. Selection of the glove material depends on consideration of the penetration times, rates of diffusion and degradation, and concentration specific to the workplace. Where hand contact with the product may occur use gloves approved to relevant standards (e.g.US: F739). Gloves must be inspected prior to use.
Eye Protection	Wear safety goggles or face shield to prevent any possibility of eye contact. Wear safety glasses with side shields (or goggles). Ensure compliance with OSHA's PPE standard (29 CFR 1910.132 and .133) for eye and face protection.
Hygiene Measures	Observe normal hygiene standards. Keep container tightly closed. 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 work, wash the skin and apply skin cream. Do not eat, drink, or smoke while using this product.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on Basic Physical and Chemical Properties

Appearance	Powder.
Color	Grey.
Odor	Odourless.
Odor Threshold - Lower	No information available.
Odor Threshold - Upper	No information available.
pH-Value, Conc. Solution	No information available.
pH-Value, Diluted Solution	No information available.
Melting Point	1250.00 - 1450.00 °C
Initial Boiling Point and Boiling Range	No information available.
Flash Point	No information available.
Evaporation Rate	No information available.
Flammability State	No information available.
Flammability Limit - Lower(%)	No information available.
Flammability Limit - Upper(%)	No information available.
Vapor Pressure	No information available.
Vapor Density (air=1)	No information available.
Relative Density	No information available.
Bulk Density	4000 - 5000 kg/m ³ .
Solubility	No information available.
Decomposition Temperature	No information available.
Partition Coefficient; n-Octanol/Water	No information available.
Auto Ignition Temperature (°C)	No information available.
Viscosity	No information available.
Explosive Properties	No information available.
Oxidizing Properties	No information available.
Molecular Weight	No information available.

Volatile Organic Compound	No information available.
Other Information	None noted.

SECTION 10: STABILITY AND REACTIVITY

Reactivity	Dangerous reactions are not expecting handling the product according to its intended use.
Polymerization Description	Unknown.
Stability	Stable under normal temperature conditions and recommended use.
Hazardous Polymerization	No information available.
Hazardous Decomposition Products	Decomposition of this product may yield metallic oxides.
Conditions to Avoid	Avoid high temperatures, moisture and sources of ignition.
Materials to Avoid	Avoid contact with water, oxidising substances and acids.

SECTION 11: TOXICOLOGICAL INFORMATION

Toxicological Information	No toxicological information for the overall finished product. Inhalation of vapours in high concentration may cause: Metal fume fever. Prolonged inhalation may be harmful. Inhalation of dusts may cause respiratory irritation. May cause damage of the central nervous system in case of repeated and prolonged exposure. Inhalation of metal-containing dusts may cause acute poisoning, leading to nausea, vomiting and abdominal pain.
Acute Toxicity (Oral LD50)	Cobalt: 6171 mg/kg (rat).
Acute Toxicity (Dermal LD50)	No information available.
Acute Toxicity (Inhalation LC50)	Cobalt: < 0.05 mg/l (4 h - Rat).
Skin Corrosion/Irritation	No information available.
Respiratory Sensitization	No information available.
Skin Sensitization	No information available.
Reproductive Toxicity:	The product is classified as a reproductive hazard.
Germ Cell Mutagenicity	No information available.
Carcinogenicity:	
Carcinogenicity	The product is classified as a carcinogen hazard.
NTP - Carcinogenicity	chromium : Not Listed. silicon : Not Listed. palladium : Not Listed. tungsten : Not Listed. Cobalt : Not Listed.
OSHA - Carcinogenicity	The product and its components are not listed.
IARC Carcinogenicity	chromium : 3 IARC Group 3 Not classifiable as to its carcinogenicity to humans. silicon : Not Listed. palladium : Not Listed. tungsten : Not Listed. Cobalt : 2B IARC Group 2B Possibly carcinogenic to humans.
Specific Target Organ Toxicity - Single Exposure:	
STOT - Single Exposure	No information available.
Specific Target Organ Toxicity - Repeated Exposure:	
STOT - Repeated Exposure	No information available.

SECTION 12: ECOLOGICAL INFORMATION

Acute Toxicity - Fish	No information available.
Acute Toxicity - Aquatic Invertebrates	No information available.
Acute Toxicity - Aquatic Plants	No information available.
Acute Toxicity - Microorganisms	No information available.
Chronic Toxicity - Fish	No information available.
Chronic Toxicity - Aquatic	No information available.

Invertebrates	No information available.
Chronic Toxicity - Aquatic Plants	No information available.
Chronic Toxicity - Microorganisms	No information available.
Ecotoxicity	This product contains a substance which is very toxic to aquatic life with long-lasting effects.
Eco Toxicological Information	No ecological toxicity available on the overall finished product.
Degradability	No information available.
Bioaccumulative Potential	No data available on bioaccumulation.
Mobility	No information available.
Results of PBT and vPvB Assessment	No information available.
Other Adverse Effects	No information available.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Management	Waste product should be disposed of via a licensed operator or may be sent to a metals reclamation facility that is able to handle fines.
Disposal Methods	Dispose in accordance with all applicable federal, state and local laws and regulations.

SECTION 14: TRANSPORT INFORMATION

UN Number

UN No. (DOT/TDG)	UN3077
UN No. (IMDG)	UN3077
UN No. (IATA)	UN3077

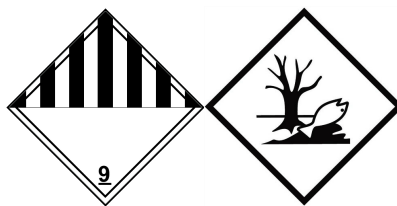
Proper Shipping Name

DOT/TDG Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Cobalt)
IMDG Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Cobalt)
IATA Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID N.O.S. (Cobalt)

Transport Hazard Class(es)

DOT/TDG Class	9
IMDG Class	9
IATA Class	9

Transport Labels



Packing Group(s)

DOT Packing Group	III
IMDG Packing Group	III
IATA Packing Group	III

Special Precautions for User

EMS	F-A, S-F
-----	----------

Environmentally Hazardous Substance/Marine Pollutant

ADR	Yes
IMDG	Yes
IATA	Yes

SECTION 15: REGULATORY INFORMATION

Approved Code of Practice

Workplace Exposure Limits Guidance Note EH40/2005. GHS Classification in accordance with 29 CFR 1910 (OSHA HCS).

US Federal Regulations

SARA Section 302 Extremely Hazardous Substances Tier II Threshold Planning Quantities

The Following Ingredients are Listed None Listed.

CERCLA/Superfund, Hazardous Substances/Reportable Quantities (EPA)

The Following Ingredients are Listed chromium

SARA Extremely Hazardous Substances EPCRA Reportable Quantities

The Following Ingredients are Listed None Listed.

SARA 313 Emission Reporting

The Following Ingredients are Listed Cobalt
chromium

CAA Accidental Release Prevention

The Following Ingredients are Listed None Listed.

OSHA Highly Hazardous Chemicals

The Following Ingredients are Listed chromium

US State Regulations

California Proposition 65 Carcinogens and Reproductive Toxins

The Following Ingredients are Listed Cobalt

California Air Toxics "Hot Spots" (A-I)

The Following Ingredients are Listed None Listed.

California Air Toxics "Hot Spots" (A-II)

The Following Ingredients are Listed None Listed.

Massachusetts "Right To Know" List

The Following Ingredients are Listed Cobalt
chromium
tungsten
silicon

Rhode Island "Right To Know" List

The Following Ingredients are Listed Cobalt
chromium
tungsten
silicon

Minnesota "Right To Know" List

The Following Ingredients are Listed Cobalt
silicon

New Jersey "Right To Know" List

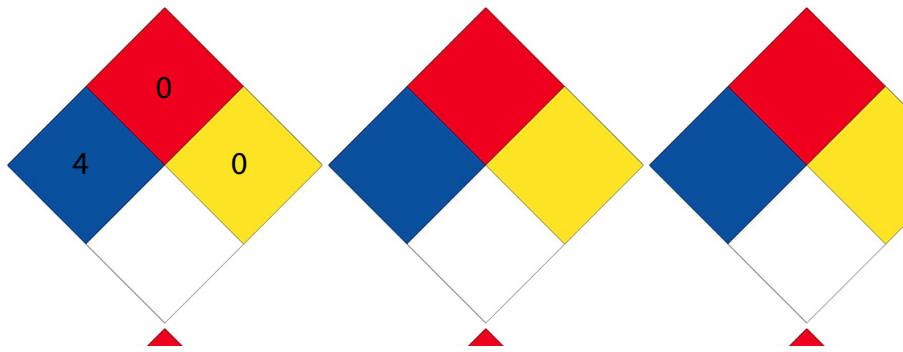
The Following Ingredients are Listed Cobalt
chromium
tungsten
silicon

Pennsylvania "Right To Know" List

The Following Ingredients are Listed Cobalt
chromium
tungsten

SECTION 16: OTHER INFORMATION

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)



HAZARDOUS MATERIAL INFORMATION SYSTEM (HMIS)

Health	4
Flammability	0
Physical Hazard	0
Personal Protection	E

General Information	No information available.
Revision Comments	This is a first issue.
Revision Date	10/17/2016
Revision	1

Disclaimer

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.