

Trade name: EOS StainlessSteel PH1**Product no.:** 9011-0019**Current version :** 5.0.0, issued: 25.02.2022**Replaced version:** 4.0.2, issued: 01.03.2021**Region:** GB**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

Trade name

EOS StainlessSteel PH1**1.2 Relevant identified uses of the substance or mixture and uses advised against****Relevant identified uses of the substance or mixture**

stainless steel powder mixture for DMLS processes in EOS M systems

Uses advised against

No data available.

1.3 Details of the supplier of the safety data sheet**Address**Electro Optical Systems Finland Oy
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20520 Turku
FINLAND

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Information provided by / telephone

+49 (0) 89 / 893 36 - 0

Advice on Safety Data Sheet

MSDSInfo@eos.info

Identification of the supplier**Address**EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
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Telephone no. +49 (0) 89 / 893 36 - 0

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1.4 Emergency telephone number

+49 (0) 89 / 893 36 - 0 (8 am - 5 pm)

+49 (0) 89 / 893 36 - 151 (Mo - Thu: 9 am - 12 pm & 1 - 6 pm; Fr: 1 - 4 pm) (CET)

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture****Classification in accordance with Regulation (EC) No 1272/2008 (CLP)**

Aquatic Chronic 3; H412

Carc. 2; H351

Skin Sens. 1; H317

STOT RE 2; H373

Classification information

This product is assessed and classified using the methods and criteria below referred to in Article 9 of Regulation (EC) n° 1272/2008:

Physical hazards: determined through assessment data based on the methods or standards referred to in part 2 of Annex I to CLP

Health hazards and environmental hazards: determined through toxicological and ecotoxicological assessment data based on the methods or standards referred to in Part 3, 4 and 5 of Annex I to CLP.

2.2 Label elements**Labelling according to Regulation (EC) No 1272/2008 (CLP Regulation)**

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Hazard pictograms



GHS07



GHS08

Signal word

Warning

Hazardous component(s) to be indicated on label:

nickel powder; [particle diameter < 1 mm]

Hazard statement(s)

H317 May cause an allergic skin reaction.
 H351 Suspected of causing cancer.
 H373 May cause damage to organs through prolonged or repeated exposure
 H412 Harmful to aquatic life with long lasting effects.

Precautionary statement(s)

P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P280 Wear protective gloves/protective clothing.
 P501 Dispose of contents/container to a facility in accordance with local and national regulations.

2.3 Other hazards

No data available.

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable. The product is not a substance.

3.2 Mixtures

Chemical characterization

stainless steel powder

Hazardous ingredients

No	Substance name	Additional information	
	CAS / EC / Index / REACH no	Classification (EC) 1272/2008 (CLP)	Concentration %
1	chromium		
	7440-47-3 231-157-5 - -	Aquatic Chronic 4; H413	>= 10.00 - < 25.00 wt%
2	nickel powder; [particle diameter < 1 mm]		
	7440-02-0 231-111-4 028-002-01-4 -	Aquatic Chronic 3; H412 Carc. 2; H351 Skin Sens. 1; H317 STOT RE 1; H372**	>= 5.00 - < 10.00 wt%
3	copper		
	7440-50-8 231-159-6 - 01-2119480154-42	Aquatic Acute 1; H400 Aquatic Chronic 2; H411	< 5.00 wt%
4	manganese		
	7439-96-5 231-105-1 - -	-	< 2.50 wt%
5	Silicon		
	7440-21-3	-	< 2.50 wt%

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231-130-8			
-			
-			

Full Text for all H-phrases and EUH-phrases: pls. see section 16

(*, **, ***, ****) Detailed explanation pls. refer to CLP regulation No. 1272/2008, annex VI, 1.2

SECTION 4: First aid measures

4.1 Description of first aid measures

General information

In case of accident or if you feel unwell, seek medical advice immediately. Remove contaminated clothing and shoes immediately, and launder thoroughly before reusing.

After inhalation

Remove affected person from the immediate area. Ensure supply of fresh air. In case of persisting adverse effects consult a physician.

After skin contact

When in contact with the skin, clean with soap and water.

After eye contact

Remove contact lenses. Rinse eye thoroughly under running water keeping eyelids wide open and protecting the unaffected eye (at least 10 to 15 minutes).

After ingestion

Call a doctor immediately.

4.2 Most important symptoms and effects, both acute and delayed

No data available.

4.3 Indication of any immediate medical attention and special treatment needed

No data available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

special powder against burning metal

Unsuitable extinguishing media

Water; Carbon dioxide; ABC powder; Foam

5.2 Special hazards arising from the substance or mixture

In the event of fire, the following can be released: Carbon dioxide (CO₂); Carbon monoxide (CO)

5.3 Advice for firefighters

Use self-contained breathing apparatus. Wear protective clothing. Run-off water from fire fighting must not be discharged into drains or enter surface water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Refer to protective measures listed in sections 7 and 8. Ensure adequate ventilation. Avoid dust formation. Avoid contact with skin, eyes and clothing. Keep away from ignition sources.

For emergency responders

No data available. Personal protective equipment (PPE) - see Section 8.

6.2 Environmental precautions

Do not discharge into the drains/surface waters/groundwater. Do not discharge into the subsoil/soil.

6.3 Methods and material for containment and cleaning up

Small quantities of spilled material may be collected dry or wet. In large quantities: Take up mechanically. When aspirators are used, make sure that they are equipped with efficient dust filters (HEPA).

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6.4 Reference to other sections

No data available.

SECTION 7: Handling and storage**7.1 Precautions for safe handling****Advice on safe handling**

Risks inherent to handling the product must be minimised by applying the appropriate protective and preventive measures. Working processes should - so far as possible, according to the state of the art - be designed to rule out bodily contact or the release of hazardous substances. Provide good ventilation at the work area (local exhaust ventilation, if necessary). Avoid contact with skin and eyes. Avoid dust formation.

General protective and hygiene measures

Do not eat, drink or smoke during work time. Keep away from foodstuffs and beverages. Wash hands before breaks and after work. Avoid contact with eyes and skin. Do not inhale dust. Remove soiled or soaked clothing immediately. Provide eye wash fountain in work area. Have emergency shower available.

Advice on protection against fire and explosion

Dust can form an explosive mixture with air. Take precautionary measures against static charges. Keep away from sources of ignition - refrain from smoking.

7.2 Conditions for safe storage, including any incompatibilities**Technical measures and storage conditions**

Keep container tightly closed and dry in a cool, well-ventilated place. Protect against mechanical damage.

Requirements for storage rooms and vessels

Containers which are opened must be carefully closed and kept upright to prevent leakage. Always keep in containers of same material as the original.

Incompatible products

Do not store together with: Mineral acids; Acids; Fluorine; ammonium nitrate; Hydrazine; performic acid; Phosphorous; selenium; sulphur; Titane plus potassium chlorate

7.3 Specific end use(s)

No data available.

SECTION 8: Exposure controls/personal protection**8.1 Control parameters****Occupational exposure limit values**

No	Substance name	CAS no.	EC no.
1	chromium	7440-47-3	231-157-5
List of approved workplace exposure limits (WELs) / EH40			
Chromium			
	WEL long-term (8-hr TWA reference period)	0.5	mg/m ³
2006/15/EC			
Chromium Metal, Inorganic Chromium (II) Compounds and Inorganic Chromium (III) Compounds (insoluble)			
	WEL long-term (8-hr TWA reference period)	2	mg/m ³
2	nickel powder; [particle diameter < 1 mm]	7440-02-0	231-111-4
List of approved workplace exposure limits (WELs) / EH40			
Nickel & its inorganic compounds (except nickel tetracarbonyl): water soluble nickel compounds (as Ni)			
	WEL long-term (8-hr TWA reference period)	0.1	mg/m ³
	Comments	Sk, Carc (nickel oxides and sulphides) Sen (nickel sulphate)	
List of approved workplace exposure limits (WELs) / EH40			
Nickel & water insoluble compounds nickel compounds (as Ni)			
	WEL long-term (8-hr TWA reference period)	0.5	mg/m ³
	Comments	Sk, Carc (nickel oxides and sulphides) Sen (nickel sulphate)	
3	copper	7440-50-8	231-159-6

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List of approved workplace exposure limits (WELs) / EH40			
Copper			
fume			
WEL long-term (8-hr TWA reference period)	0.2	mg/m ³	
List of approved workplace exposure limits (WELs) / EH40			
Copper			
dusts and mists			
Cu			
WEL short-term (15 min reference period)	2	mg/m ³	
WEL long-term (8-hr TWA reference period)	1	mg/m ³	
4	manganese	7439-96-5	231-105-1
2017/164/EU			
Manganese and inorganic manganese compounds (as manganese)			
WEL long-term (8-hr TWA reference period)	0,2 (Inhal)	mg/m ³	
2017/164/EU			
Manganese and inorganic manganese compounds (as manganese)			
WEL long-term (8-hr TWA reference period)	0,05 (Resp)	mg/m ³	
List of approved workplace exposure limits (WELs) / EH40			
Manganese and its inorganic compounds (as Mn) Inhalable fraction			
WEL long-term (8-hr TWA reference period)	0.2	mg/m ³	
List of approved workplace exposure limits (WELs) / EH40			
Manganese and its inorganic compounds (as Mn) Respirable fraction			
WEL long-term (8-hr TWA reference period)	0.05	mg/m ³	
5	Silicon	7440-21-3	231-130-8
List of approved workplace exposure limits (WELs) / EH40			
Silicon			
total inhalable dust			
WEL long-term (8-hr TWA reference period)	10	mg/m ³	
List of approved workplace exposure limits (WELs) / EH40			
Silicon			
respirable dust			
WEL long-term (8-hr TWA reference period)	4	mg/m ³	

DNEL, DMEL and PNEC values

DNEL values (worker)

No	Substance name			CAS / EC no	
	Route of exposure	Exposure time	Effect	Value	
1	copper			7440-50-8 231-159-6	
	dermal	Short term (acut)	systemic	273	mg/kg/day
	dermal	Long term (chronic)	systemic	137	mg/kg/day
	inhalative	Long term (chronic)	local	1	mg/m ³
	inhalative	Short term (acut)	local	1	mg/m ³

DNEL value (consumer)

No	Substance name			CAS / EC no	
	Route of exposure	Exposure time	Effect	Value	
1	copper			7440-50-8 231-159-6	
	oral	Long term (chronic)	systemic	0.041	mg/kg/day
	dermal	Short term (acut)	systemic	273	mg/kg/day
	dermal	Long term (chronic)	systemic	137	mg/kg/day
	inhalative	Short term (acut)	local	1	mg/m ³
	inhalative	Long term (chronic)	local	1	mg/m ³

PNEC values

No	Substance name		CAS / EC no
	ecological compartment	Type	Value
1	copper		7440-50-8

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			231-159-6	
water	fresh water		7.8	µg/L
water	marine water		5.2	µg/L
water	fresh water sediment		87	mg/kg
water	marine water sediment		676	mg/kg
soil	-		65	mg/kg
sewage treatment plant	-		230	µg/L

8.2 Exposure controls

Appropriate engineering controls

No data available.

Personal protective equipment

Respiratory protection

If workplace exposure limits are exceeded, a respiration protection approved for this particular job must be worn. In case of dust formation, take appropriate measures for breathing protection in the event that workplace threshold values are not specified. Respirator with particulate filter (filter cat. P 3)

Eye / face protection

Safety glasses with side protection shield (EN 166)

Hand protection

In case of intensive contact, wear protective gloves (EN 374). Before use, the protective gloves should be tested in any case for its specific work-station suitability (i.e. mechanical resistance, product compatibility and antistatic properties). Adhere to the manufacturer's instructions and information relating to the use, storage, care and replacement of protective gloves. Protective gloves shall be replaced immediately when physically damaged or worn. Design operations thus to avoid permanent use of protective gloves.

Other

Wear fully closed clothing. Closed ESD safety footwear (ESD according to EN 61340-4-3 or equivalent).

Environmental exposure controls

No data available.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

State of aggregation	solid
Form/Colour	Powder grey
Odour	odourless
pH value	No data available
Boiling point / boiling range	No data available
Melting point/freezing point	No data available
Decomposition temperature	No data available
Flash point	no data available
Ignition temperature	No data available

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Explosive properties	
The product does not have explosive properties.	
Flammability	
No data available	
Lower explosion limit	
Not applicable	
Upper explosion limit	
Not applicable	
Vapour pressure	
No data available	
Relative vapour density	
No data available	
Relative density	
No data available	
Density	
Value	3.5 - 5.0 g/cm ³
Solubility in water	
Comments	insoluble
Solubility	
No data available	
Partition coefficient n-octanol/water (log value)	
No data available	
Viscosity	
No data available	
Particle characteristics	
No data available	

9.2 Other information

Other information	
No data available.	

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available.

10.2 Chemical stability

No data available.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Heat, naked flames and other ignition sources. Spontaneously inflammable when finely dispersed. Hydrogen gas is released upon contact with mineral acids and may form explosive compounds with air. May form toxic gaseous nickel carbonyl under certain conditions (high pressure, high carbon monoxide concentration).

10.5 Incompatible materials

Mineral acids; Acids; Fluorine; ammonium nitrate; Hydrazine; performic acid; Phosphorous; selenium; Sulphur; Titane plus potassium chlorate

10.6 Hazardous decomposition products

No hazardous decomposition products known. Because of the thermal load in the process chamber new phases can be generated.

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SECTION 11: Toxicological information

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

Acute oral toxicity			
No	Substance name	CAS no.	EC no.
1	nickel powder; [particle diameter < 1 mm]	7440-02-0	231-111-4
LD50		> 9000	mg/kg bodyweight
Species	rat		
Method	OECD 401		
Source	Manufacturer		

Acute dermal toxicity			
No data available			

Acute inhalational toxicity			
No	Substance name	CAS no.	EC no.
1	nickel powder; [particle diameter < 1 mm]	7440-02-0	231-111-4
ATE		10.2	mg/l
Duration of exposure		1	h
State of aggregation	mist		
Species	rat		
Source	Manufacturer		

Skin corrosion/irritation			
No	Substance name	CAS no.	EC no.
1	nickel powder; [particle diameter < 1 mm]	7440-02-0	231-111-4
Duration of exposure		4	h
Species	rabbit		
Source	Manufacturer		
Evaluation	non-irritant		

Serious eye damage/irritation			
No	Substance name	CAS no.	EC no.
1	nickel powder; [particle diameter < 1 mm]	7440-02-0	231-111-4
Duration of exposure		48	h
Species	rabbit		
with reference to	Nickel sulphate (Read across)		
Method	OECD 405		
Source	Manufacturer		
Evaluation	non-irritant		

Respiratory or skin sensitisation			
No data available			

Germ cell mutagenicity			
No	Substance name	CAS no.	EC no.
1	nickel powder; [particle diameter < 1 mm]	7440-02-0	231-111-4
Route of exposure	oral		
NOAEL		10	mg/kg
Duration of exposure		70	day(s)
Species	rats (male/female)		
with reference to	Nickel sulphate (Read across)		
Method	OECD 416		
Source	Manufacturer		

Reproduction toxicity			
No	Substance name	CAS no.	EC no.
1	nickel powder; [particle diameter < 1 mm]	7440-02-0	231-111-4
Route of exposure	oral		
NOAEL		10	mg/kg
Duration of exposure		70	day(s)

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Species with reference to Method	rats (male/female) Nickel sulphate (Read across) OECD 416
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Carcinogenicity			
No	Substance name	CAS no.	EC no.
1	nickel powder; [particle diameter < 1 mm]	7440-02-0	231-111-4
Evaluation/classification		Suspected of causing cancer.	

STOT - single exposure			
No	Substance name	CAS no.	EC no.
1	nickel powder; [particle diameter < 1 mm]	7440-02-0	231-111-4
Evaluation/classification		Based on available data, the classification criteria are not met.	

STOT - repeated exposure			
No	Substance name	CAS no.	EC no.
1	nickel powder; [particle diameter < 1 mm]	7440-02-0	231-111-4
Route of exposure		oral	
NOAEL		2.2	mg/kg
Species with reference to Method	rats (male/female) Nickel sulphate (Read across) OECD 451		
Source	Manufacturer		
Evaluation/classification		Based on available data, the classification criteria are met.	
Route of exposure		oral	
LOAEL		6.7	mg/kg
Species with reference to Method	rats (male/female) Nickel sulphate (Read across) OECD 451		
Source	Manufacturer		

Aspiration hazard	
No data available	

Symptoms related to the physical, chemical and toxicological characteristics	
Eye contact may cause mechanical irritation through dust particles.	

Delayed and immediate effects as well as chronic effects from short and long-term exposure	
Inhalation of dusts may irritate the respiratory tract. Danger of acute health hazards by longer exposure. Possibility of sensitisation through skin contact.	

11.2 Information on other hazards

Endocrine disrupting properties

No data available.

Other information

No data available.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish (acute)			
No	Substance name	CAS no.	EC no.
1	copper	7440-50-8	231-159-6
LC50		0.035	mg/l
Duration of exposure		96	h
Species	Danio rerio		
Method	ISO TC 147/SC 5/WG3 (secretariat 6)		
Source	ECHA / Read across		

Toxicity to fish (chronic)	

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No	Substance name	CAS no.	EC no.
1	copper	7440-50-8	231-159-6
	NOEC		0.023 mg/l
	Duration of exposure		7 day(s)
	Species	Pimephales promelas	
	Method	OECD 204	
	Source	ECHA	

Toxicity to Daphnia (acute)			
No	Substance name	CAS no.	EC no.
1	copper	7440-50-8	231-159-6
	EC50	0.034	- 0.792 mg/l
	Duration of exposure		48 h
	Species	Daphnia magna	
	Method	OECD 202	
	Source	ECHA	

Toxicity to Daphnia (chronic)			
No	Substance name	CAS no.	EC no.
1	copper	7440-50-8	231-159-6
	NOEC		0.032 mg/l
	Duration of exposure		7 day(s)
	Species	Daphnia magna	
	Method	OECD 211	

Toxicity to algae (acute)			
No data available			

Toxicity to algae (chronic)			
No data available			

Bacteria toxicity			
No data available			

12.2 Persistence and degradability

No data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

No data available.

12.6 Endocrine disrupting properties

No data available.

12.7 Other adverse effects

No data available.

12.8 Other information

Other information
The product should not be allowed to enter drains or water courses. Ecological data are not available.

SECTION 13: Disposal considerations**13.1 Waste treatment methods****Product**

Allocation of a waste code number, according to the European Waste Catalogue, should be carried out in agreement with the regional waste disposal company.

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Packaging

Residues must be removed from packaging and when emptied completely disposed of in accordance with the regulations for waste removal. Incompletely emptied packaging must be disposed of in the form of disposal specified by the regional disposer.

SECTION 14: Transport information**14.1 Transport ADR/RID/ADN**

The product is not subject to ADR/RID/ADN regulations.

14.2 Transport IMDG

The product is not subject to IMDG regulations.

14.3 Transport ICAO-TI / IATA

The product is not subject to ICAO-TI / IATA regulations.

14.4 Other information

No data available.

14.5 Environmental hazards

Information on environmental hazards, if relevant, please see 14.1 - 14.3.

14.6 Special precautions for user

No data available.

14.7 Maritime transport in bulk according to IMO instruments

Not relevant

SECTION 15: Regulatory information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****EU regulations****Regulation (EC) No 1907/2006 (REACH) Annex XIV (List of substances subject to authorisation)**

According to the data available and/or specifications supplied by upstream suppliers, this product does not contain any substances considered as substances requiring authorisation as listed on Annex XIV of the REACH regulation (EC) 1907/2006.

REACH candidate list of substances of very high concern (SVHC) for authorisation

According to available data and the information provided by preliminary suppliers, the product does not contain substances that are considered substances meeting the criteria for inclusion in annex XIV (List of Substances Subject to Authorisation) as laid down in Article 57 and article 59 of REACH (EC) 1907/2006.

Regulation (EC) No 1907/2006 (REACH) Annex XVII: RESTRICTIONS ON THE MANUFACTURE, PLACING ON THE MARKET AND USE OF CERTAIN DANGEROUS SUBSTANCES, MIXTURES AND ARTICLES

The product contains following substance(s) that are considered being subject to REACH regulation (EC) 1907/2006 annex XVII.

No	Substance name	CAS no.	EC no.	No
1	chromium	7440-47-3	231-157-5	75
2	copper	7440-50-8	231-159-6	75
3	nickel powder; [particle diameter < 1 mm]	7440-02-0	231-111-4	27, 75
4	niobium	7440-03-1	231-113-5	75

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances

This product is not subject to Part 1 or 2 of Annex I.

Other regulations

Adhere to the national sanitary and occupational safety regulations when using this product.

15.2 Chemical safety assessment

A chemical safety assessment has not been carried out for this mixture.

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SECTION 16: Other information

Sources of key data used to compile the data sheet:

Regulation (EC) No 1907/2006 (REACH), 1272/2008 (CLP) as amended in each case.

Directives 2000/39/EC, 2006/15/EC, 2009/161/EU, (EU) 2017/164.

National Threshold Limit Values of the corresponding countries as amended in each case.

Transport regulations according to ADR, RID, IMDG, IATA as amended in each case.

The data sources used to determine physical, toxic and ecotoxic data, are indicated directly in the corresponding section.

Full text of the H- and EUH- phrases drawn up in sections 2 and 3 (provided not already drawn up in these sections)

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.
H413	May cause long lasting harmful effects to aquatic life.

Creation of the safety data sheet

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This information is based on our present knowledge and experience.

The safety data sheet describes products with a view to safety requirements.

It does not however, constitute a guarantee for any specific product properties and shall not establish a legally valid contractual relationship.

Alterations/supplements:

Alterations to the previous edition are marked in the left-hand margin.

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