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
Lemminkäisenkatu 36
20520 Turku
FINLAND

Telephone no. +358 (0) 20 765 9144 / 9147
Fax no. +358 (0) 20 765 9141

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
82152 Krailling / München
GERMANY

Telephone no. +49 (0) 89 / 893 36 - 0
Fax no. +49 (0) 89 / 893 36 - 22 85

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)

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%

	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 equiped with efficient dust filtres (HEPA).

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/m³	
	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/m³	
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/m³	
	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/m³	
	Comments	Sk, Carc (nickel oxides and sulphides) Sen (nickel sulphate)	
3	**copper**	**7440-50-8**	**231-159-6**

	List of approved workplace exposure limits (WELs) / EH40			
	Copper			
	fume			
	WEL long-term (8-hr TWA reference period)	0.2	mg/m³	
	List of approved workplace exposure limits (WELs) / EH40			
	Copper			
	dusts and mists Cu			
	WEL short-term (15 min reference period)	2	mg/m³	
	WEL long-term (8-hr TWA reference period)	1	mg/m³	
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/m³	
	2017/164/EU			
	Manganese and inorganic manganese compounds (as manganese)			
	WEL long-term (8-hr TWA reference period)	0,05 (Resp)	mg/m³	
	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/m³	
	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/m³	
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/m³	
	List of approved workplace exposure limits (WELs) / EH40			
	Silicon			
	respirable dust			
	WEL long-term (8-hr TWA reference period)	4	mg/m³	

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/m³
	inhalative	Short term (acut)	local	1	mg/m³

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/m³
	inhalative	Long term (chronic)	local	1	mg/m³

PNEC values

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

			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

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/cm³

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 carbonyle under certain conditions (high pressure, high carbon moxide 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.

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)

Species	rats (male/female)
with reference to	Nickel sulphate (Read across)
Method	OECD 416

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	rats (male/female)		
with reference to	Nickel sulphate (Read across)		
Method	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	rats (male/female)		
with reference to	Nickel sulphate (Read across)		
Method	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)

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.

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.

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
UMCO GmbH
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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.

Prod-ID 603264