

## Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878 Issue date: 9/10/2018 Revision date: 29/8/2023 Version: 2.1

## SECTION 1: Identification of the substance/mixture and of the company/undertaking 1.1. Product identifier Product form : Mixture Trade name : EOS Titanium Ti64 Grade 5/ Ti64 Grade 23 Product code : 9011-0045; 9011-0046 Type of product : Metal powder UFI : Y9N9-JP2U-FC85-DHH0 1.2. Relevant identified uses of the substance or mixture and uses advised against 1.2.1. Relevant identified uses Industrial/Professional use spec : Industrial : Ti6Al4V pre-alloyed powder for DMLS processes in EOS M systems Use of the substance/mixture 1.2.2. Uses advised against No additional information available 1.3. Details of the supplier of the safety data sheet Supplier Electro Optical Systems Finland Oy Lemminkäisenkatu 36 20520 Turku FINLAND T +358 (0) 20 765 9144/9147 - F +358 (0) 20 765 9141 MSDSInfo@eos.info - https://www.eos.info/ 1.4. Emergency telephone number Emergency number : +49 (0) 89 / 893 36 - 0 (8 am - 5 pm); +49 (0) 89 / 893 36 - 151 (Mon-Thurs 9 am - 12 pm & 1 pm - 6 pm; Fri 1 pm - 4 pm (CET)) **SECTION 2: Hazards identification** 2.1. Classification of the substance or mixture Classification according to Regulation (EC) No. 1272/2008 [CLP] H228 Flammable solids, Category 1 Full text of H- and EUH-statements: see section 16 Adverse physicochemical, human health and environmental effects No additional information available 2.2. Label elements Labelling according to Regulation (EC) No. 1272/2008 [CLP] Hazard pictograms (CLP) GHS02 Signal word (CLP) : Danger Hazard statements (CLP) : H228 - Flammable solid. Precautionary statements (CLP) : P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P280 - Wear protective gloves. P240 - Ground and bond container and receiving equipment. P241 - Use explosion-proof Complete protective clothing equipment. P370+P378 - In case of fire: Use Dry extinguishing powder, sand to extinguish.

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### 2.3. Other hazards

Contains no PBT/vPvB substances ≥ 0.1% assessed in accordance with REACH Annex XIII

The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0,1 %

## **SECTION 3: Composition/information on ingredients**

### 3.1. Substances

Not applicable

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3.2. Mixtures
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Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Titanium	CAS-No.: 7440-32-6 EC-No.: 231-142-3 REACH-no: 01-2119484878-14	89 – 91	Not classified
Aluminum	CAS-No.: 7429-90-5 EC-No.: 231-072-3 EC Index-No.: 013-002-00-1 REACH-no: 01-2119529243-45	5.5 – 6.75	Flam. Sol. 1, H228 Water-react. 2, H261

Full text of H- and EUH-statements: see section 16

SECTION 4: First aid measures		
4.1. Description of first aid measures		
First-aid measures general	: Never give anything by mouth to an unconscious person.	
First-aid measures after inhalation	: Allow affected person to breathe fresh air. Allow the victim to rest.	
First-aid measures after skin contact	: Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. Brush off loose particles from skin.	
First-aid measures after eye contact	: Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persists.	
First-aid measures after ingestion	: Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.	
4.2. Most important symptoms and effects, both acute and delayed		
Symptoms/effects	: Not expected to present a significant hazard under anticipated conditions of normal use.	

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

No additional information available

SECTION 5: Firefighting measured	es	
5.1. Extinguishing media		
Suitable extinguishing media Unsuitable extinguishing media	<ul><li>Dry powder. Sand.</li><li>Water. Foam. Carbon dioxide (CO2).</li></ul>	
5.2. Special hazards arising from the substance or mixture		
Fire hazard	: Explosive dust-air mixtures may form.	

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5.3. Advice for firefighters	
Firefighting instructions	: Exercise caution when fighting any chemical fire. Prevent fire fighting water from entering the environment.
Protective equipment for firefighters	: Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures		
6.1. Personal precautions, prote	ective equipment and emergency procedures	
General measures	: Do not allow contact with air. Avoid creating or spreading dust. Refer to protective measures listed in Sections 7 and 8.	
6.1.1. For non-emergency personnel	l la	
Protective equipment	: Refer to chapter 8.	
Emergency procedures	: Evacuate unnecessary personnel.	
6.1.2. For emergency responders		
Protective equipment	: Equip cleanup crew with proper protection.	
Emergency procedures	: Ventilate area.	

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment an	d cleaning up
5 1	On land, sweep or shovel into suitable containers. Minimise generation of dust. Store away from other materials. Take up mechanically (sweeping, shovelling) and collect in suitable container for disposal.

#### 6.4. Reference to other sections

See Section 8. Exposure controls and personal protection.

SECTION 7: Handling and storage			
7.1. Precautions for safe handling			
Additional hazards when processed Precautions for safe handling	<ul> <li>Handle empty containers with care because residual vapours are flammable. Catches fire spontaneously if exposed to air. Do not allow contact with water. Avoid creating or spreading dust.</li> <li>Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapour. No open flames. No smoking. Do not allow contact with air.</li> </ul>		
7.2. Conditions for safe storage, including any incompatibilities			
Technical measures Storage conditions Incompatible products Incompatible materials Special rules on packaging	<ul> <li>Do not handle or store near heat, sparks, or any other potential ignition sources.</li> <li>Keep container closed when not in use. Store in a dry place. Protect from moisture.</li> <li>Strong bases. Strong acids.</li> <li>Sources of ignition. Direct sunlight. Heat sources. Do not allow contact with water.</li> <li>Store in a closed container.</li> </ul>		
7.3. Specific end use(s)			

No additional information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

8.1.1 National occupational exposure and biological limit values

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EOS Titanium Ti64 Grade 5/ Ti64 Grade 23		
United Kingdom - Occupational Exposure Limits		
Local name	Aluminium	
WEL TWA (OEL TWA) [1]	2 mg/m <sup>3</sup> alkyl compounds 2 mg/m <sup>3</sup> salts, soluble 10 mg/m <sup>3</sup> metal, inhalable dust 4 mg/m <sup>3</sup> metal, respirable dust	
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE	
Aluminum (7429-90-5)		
United Kingdom - Occupational Exposure Limits		
Local name	Aluminium	
WEL TWA (OEL TWA) [1]	10 mg/m <sup>3</sup> (inhalable dust) 4 mg/m <sup>3</sup> (respirable dust)	
WEL STEL (OEL STEL)	12 mg/m <sup>3</sup> (calculated value)	
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE	

### 8.1.2. Recommended monitoring procedures

No additional information available

### 8.1.3. Air contaminants formed

No additional information available

## 8.1.4. DNEL and PNEC

DNEL/DMEL (Workers) aliminium powder (stabilised)		
Long-term - local effects, systemic	3,72 mg/ m³	
Long-term - systemic effects, local	3,72 mg/ m³	
DNEL/DMEL (Consumer) aliminium powder (stabilised)		
Long-term – systemic effects, oral	7,9 mg/kg/day	
PNEC (Water) aliminium powder (stabilised)		
PNEC aqua (freshwater)	74,9 mg/L	
PNEC (Sewage treatment plant) aliminium powder (stabilised)		
PNEC sewage treatment plant	20 mg/L	
DNEL/DMEL (Consumer) titanium		
Long-term – systemic effects, oral	350 mg/kg/day	
PNEC (Water) titanium		
PNEC aqua (freshwater)	0,076 mg/L	
PNEC aqua (marine water)	0,6 mg/L	
PNEC aqua (fresh water sediment)	600 mg/kg dry weight	
PNEC aqua (marine water sediment)	60 mg/kg dry weight	
PNEC aqua (aqua intermittent)	0,37 mg/L	
PNEC (Sewage treatment plant) titanium		
PNEC sewage treatment plant	60 mg/L	
PNEC (soil) titanium		
PNEC soil	60 mg/kg/ dry weight	

## 8.1.5. Control banding

No additional information available

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### 8.2. Exposure controls

### 8.2.1. Appropriate engineering controls

#### Appropriate engineering controls:

Dust must be extracted directly at the point of origin. Use only in well-ventilated areas.

### 8.2.2. Personal protection equipment

#### Personal protective equipment:

Avoid all unnecessary exposure.

Personal protective equipment symbol(s):



#### 8.2.2.1. Eye and face protection

#### Eye protection:

Wear approved safety goggles. Chemical goggles should be consistent with EN166 or equivalent

#### 8.2.2.2. Skin protection

Skin and body protection:

Wear suitable coveralls to prevent exposure to the skin. Dust production: dust mask with filter type P3

Hand protection:

Wear protective gloves. Appropriate material: butyl rubber; nitrile rubber.

#### Other skin protection

Materials for protective clothing: Wear suitable protective clothing. safety foot-wear

#### 8.2.2.3. Respiratory protection

## Respiratory protection:

Wear appropriate mask

## 8.2.2.4. Thermal hazards

No additional information available

8.2.3. Environmental exposure controls

#### Other information:

Do not eat, drink or smoke during use.

## **SECTION 9: Physical and chemical properties**

## 9.1. Information on basic physical and chemical properties

		0.11.1
Physical state	:	Solid
Colour	:	Grey
Appearance	:	Powder
Odour	:	Odourless
Odour threshold	:	Not applicable
Melting point	:	Not available
Freezing point	:	Not available
Boiling point	:	Not available
Flammability	:	Flammable
Explosive limits	:	Not applicable
Lower explosion limit	:	60 g/m³
Upper explosion limit	:	Not applicable
Flash point	:	Not available
Auto-ignition temperature	:	Not available
Decomposition temperature	:	Not available

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#### 9.2. Other information

9.2.1. Information with regard to physical hazard classes		
Smouldering temperature	: > 400 °C	
Minimum Ignition Energy (MIE) (with Inductivity)	: 300 mJ < MIE < 1000 mJ	
Minimum Ignition Energy (MIE) (without Inductivity)	: MIE > 1000 mJ	
Burning Class	: At 20 °C - ("BZ") and 100 °C - ("BZ") 4	
Kst	: 36 bar*m/s	
9.2.2. Other safety characteristics		
Relative evaporation rate (butylacetate=1)	: Not determined	

### **SECTION 10: Stability and reactivity**

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10	.1.	Re	act	:IV	Ίtγ

No additional information available

**10.2. Chemical stability** 

Stable under normal conditions of use. Catches fire spontaneously if exposed to air.

10.3. Possibility of hazardous reactions

### No data available.

### 10.4. Conditions to avoid

Extremely high or low temperatures. Avoid ignition sources. Explosive dust-air mixtures may form. Direct sunlight. Do not allow contact with air. Open flame. Overheating. Heat. Sparks.

**10.5. Incompatible materials** 

Explosive substances and articles. Acids. Strong alkalis. Strong oxidizing agents. Halogenated compounds. Strong acids. Strong bases.

**10.6. Hazardous decomposition products** 

Hydrogen. Fume. Carbon monoxide. Carbon dioxide.

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SECTION 11: Toxicological information			
11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008			
Acute toxicity (oral) Acute toxicity (dermal) Acute toxicity (inhalation)	<ul> <li>Not classified</li> <li>Not classified</li> <li>Not classified</li> </ul>		
Titanium (7440-32-6)			
LD50 oral rat	<ul> <li>&gt; 5000 mg/kg bodyweight Animal: rat, Animal sex: female, Guideline: OECD Guideline</li> <li>425 (Acute Oral Toxicity: Up-and-Down Procedure), Guideline: EPA OPPTS 870.1100</li> <li>(Acute Oral Toxicity)</li> </ul>		
Aluminum (7429-90-5)			
LC50 Inhalation - Rat	> 0.888 mg/l/4h		
Skin corrosion/irritation	: Not classified pH: Not determined		
Additional information Serious eye damage/irritation	<ul> <li>Based on available data, the classification criteria are not met</li> <li>Not classified</li> <li>pH: Not determined</li> </ul>		
Additional information	: Based on available data, the classification criteria are not met		
Respiratory or skin sensitisation Additional information	<ul> <li>Not classified</li> <li>Based on available data, the classification criteria are not met</li> </ul>		
Germ cell mutagenicity Additional information	: Not classified : Based on available data, the classification criteria are not met		
Carcinogenicity Additional information	<ul> <li>Not classified</li> <li>Based on available data, the classification criteria are not met</li> </ul>		
Reproductive toxicity Additional information	<ul><li>Not classified</li><li>Based on available data, the classification criteria are not met</li></ul>		
STOT-single exposure Additional information	<ul><li>Not classified</li><li>Based on available data, the classification criteria are not met</li></ul>		
STOT-repeated exposure Additional information	<ul><li>Not classified</li><li>Based on available data, the classification criteria are not met</li></ul>		
Aspiration hazard Additional information	<ul><li>Not classified</li><li>Based on available data, the classification criteria are not met</li></ul>		
EOS Titanium Ti64 Grade 5/ Ti64 Grade 23			
Viscosity, kinematic	Not applicable		
11.2. Information on other hazards			
11.2.1. Endocrine disrupting properties No additional information available			
11.2.2. Other information			
Potential Adverse human health effects and symptoms	: Based on available data, the classification criteria are not met		

SECTION 12: Ecological information		
12.1. Toxicity		
Hazardous to the aquatic environment, short-term : (acute)	Not classified	
Hazardous to the aquatic environment, long-term : (chronic)	Not classified	
Titanium (7440-32-6)		
EC50 72h - Algae [1]	> 10000 mg/l Test organisms (species): Skeletonema costatum	

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12.2. Persistence and degradability				
EOS Titanium Ti64 Grade 5/ Ti64 Grade 23	EOS Titanium Ti64 Grade 5/ Ti64 Grade 23			
Persistence and degradability	Not established.			
12.3. Bioaccumulative potential				
EOS Titanium Ti64 Grade 5/ Ti64 Grade 23				
Partition coefficient n-octanol/water (Log Pow)	Not applicable			
Bioaccumulative potential	Not established.			
12.4. Mobility in soil				
No additional information available				
12.5. Results of PBT and vPvB assessment				
No additional information available				
12.6. Endocrine disrupting properties				
No additional information available				
12.7. Other adverse effects				
Additional information :	Avoid release to the environment.			

SECTION 13: Disposal considerations	
13.1. Waste treatment methods	
Product/Packaging disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.
	<ul><li>Handle empty containers with care because residual vapours are flammable.</li><li>Avoid release to the environment.</li></ul>

## **SECTION 14: Transport information**

n accordance with ADR / IMDG / IATA / ADN / RID					
ADR	IMDG	ΙΑΤΑ	ADN	RID	
14.1. UN number or ID n	umber				
UN 3089	UN 3089	UN 3089	UN 3089	UN 3089	
14.2. UN proper shippin	g name	·			
METAL POWDER, FLAMMABLE, N.O.S.	AMETAL POWDER, FLAMMABLE, N.O.S.	METAL POWDER, FLAMMABLE, N.O.S.	METAL POWDER, FLAMMABLE, N.O.S.	METAL POWDER, FLAMMABLE, N.O.S.	
Transport document descr	iption				
UN 3089 METAL POWDER, FLAMMABLE, N.O.S., 4.1, II, (E)	UN 3089 METAL POWDER, FLAMMABLE, N.O.S., 4.1, II, (E)	UN 3089 METAL POWDER, FLAMMABLE, N.O.S., 4.1, II, (E)	UN 3089 METAL POWDER, FLAMMABLE, N.O.S., 4.1, II	UN 3089 METAL POWDER, FLAMMABLE, N.O.S., 4.1, II	
14.3. Transport hazard class(es)					
4.1	4.1	4.1	4.1	4.1	

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ADR	IMDG	ΙΑΤΑ	ADN	RID
14.4. Packing group				
II	II	II	II	II
14.5. Environmental haz	ards			
Dangerous for the environment: No	Dangerous for the environment: No Marine pollutant: No	Dangerous for the environment: No	Dangerous for the environment: No	Dangerous for the environment: No
No supplementary informatio	n available			•
4.6. Special precaution	s for user			
Dverland transport Classification code (ADR) Special provisions (ADR) Limited quantities (ADR) Excepted quantities (ADR) Packing instructions (ADR) Special packing provisions (A Mixed packing provisions (AD Portable tank and bulk contain Portable tank and bulk contain Portable tank and bulk contain ADR) Fank code (ADR) /ehicle for tank carriage Fransport category (ADR) Special provisions for carriage Hazard identification number Drange plates Funnel restriction code (ADR) EAC code	: 11 : E : P DR) : B R) : M her instructions (ADR) : T her special provisions : T : S : A : 2 e - Packages (ADR) : V (Kemler No.) : 4	52 (g 2 002, IBC08 4 IP11 3 P33 GAN T 11 2 40 3089		
Special packing provisions (IMDG):PPIBC packing instructions (IMDG):IBCIBC special provisions (IMDG):B2Tank instructions (IMDG):T3Tank special provisions (IMDG):TPEmS-No. (Fire):F-CEmS-No. (Spillage):S-CStowage category (IMDG):AStowage and handling (IMDG):SGProperties and observations (IMDG):If uespreadread:read:read:Stowage and handling (IMDG):Stowage and baservations (IMDG)		kg 2 002 P38 3C08 21, B4 3 P33 -G -G	berty of evolving hydrogen ga th oil or wax it does not at ord alis, evolving hydrogen, a flar	linary temperatures. React mmable gas. Reacts readil

substances. In the event of breakage of receptacles, the scattered powder is readily ignited

by sparks or open flame and may give rise to an explosive atmosphere.

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PCA Excepted quantities (IATA) PCA Limited quantities (IATA) PCA limited quantity max net quantity (IATA) PCA packing instructions (IATA) PCA max net quantity (IATA) CAO packing instructions (IATA) CAO max net quantity (IATA) Special provisions (IATA) ERG code (IATA)	: E2 : Y441 : 5kg : 445 : 15kg : 448 : 50kg : A3, A803 : 3L
Inland waterway transport	: F3
Classification code (ADN) Special provisions (ADN)	: 552
Limited quantities (ADN)	: 1 kg
Excepted quantities (ADN)	: E2
Equipment required (ADN)	: PP
Number of blue cones/lights (ADN)	: 1
Rail transport	
Classification code (RID)	: F3
Special provisions (RID)	: 552
Limited quantities (RID)	: 1kg
Excepted quantities (RID)	: E2
Packing instructions (RID)	: P002, IBC08
Special packing provisions (RID)	: B4
Mixed packing provisions (RID) Portable tank and bulk container instructions (RID)	: MP11 : T3
Portable tank and bulk container instructions (KiD)	: TP33
(RID)	. 11 55
Tank codes for RID tanks (RID)	: SGAN
Transport category (RID)	: 2
Special provisions for carriage – Packages (RID)	: W1
Colis express (express parcels) (RID)	: CE10
Hazard identification number (RID)	: 40

14.7. Maritime transport in bulk according to IMO instruments

Not applicable

## **SECTION 15: Regulatory information**

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

#### 15.1.1. EU-Regulations

#### **REACH Annex XVII (Restriction List)**

Contains no substance(s) listed on REACH Annex XVII (Restriction Conditions)

### **REACH Annex XIV (Authorisation List)**

Contains no substance(s) listed on REACH Annex XIV (Authorisation List)

#### **REACH Candidate List (SVHC)**

Contains no substance(s) listed on the REACH Candidate List

#### **Explosives Precursors Regulation (2019/1148)**

Contains substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors) ANNEX II REPORTABLE EXPLOSIVES PRECURSORS

List of substances on their own or in mixtures or in substances for which suspicious transactions and significant disappearances and thefts are to be reported to the relevant national contact point within 24 hours.

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Name	CAS-No.	Combined Nomenclature code (CN)	Combined Nomenclature code for mixture without constituents which would determine classification under another CN code
Aluminium, powders	7429-90-5	7603 10 00; ex 7603 20 00	

Please see https://ec.europa.eu/home-affairs/system/files/2021-11/list\_of\_competent\_authorities\_and\_national\_contact\_points\_en.pdf

#### 15.1.2. National regulations

No additional information available

**15.2. Chemical safety assessment** 

No chemical safety assessment has been carried out

## **SECTION 16: Other information**

#### Indication of changes:

According to Regulation (EU) 2015/830, 2020/878 (REACH Annex II).

Sources of Key data

 Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (et sequens).
 None.

#### Other information

Full text of H- and EUH-statements:		
Flam. Sol. 1 Flammable solids, Category 1		
H228	Flammable solid.	
H261	In contact with water releases flammable gases.	
Water-react. 2	Substances and Mixtures which, in contact with water, emit flammable gases, Category 2	

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]		
Flam. Sol. 1	H228	Calculation method

Safety Data Sheet (SDS), EU

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.