

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

### 1.1. Product identifier

# MSUPPLY - Ti64

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

**Relevant identified uses:** For applications in laser-based additive manufacturing technologies (SLS, DMLS and SLM) and cold spray applications.

**Uses advised against:** No information available.

### 1.3. Details of the supplier of the safety data sheet

#### Supplier

Dr. Andreas Pelz

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D 39130 Magdeburg

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#### Information contact

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**Website** www.metals4printing.com

### 1.4. Emergency telephone number

Giftnotruf München  
Euro Emergency Number: 112

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## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

Regulation (EC) No 1272/2008:

Flam. Sol. 1/2, H228

### 2.2. Label elements

Classification according to Regulation (EC) No 1272/2008 [CLP]

Hazard pictograms



**Signal word:** GHS02  
Danger

**Hazard statements:**

H228 Flammable solid.

**Precautionary statements:**

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P240 Ground and bond container and receiving equipment.  
P241 Use explosion-proof electrical/ventilating/lighting equipment.  
P280 Wear protective gloves/protective clothing/eye protection/face  
P370+378 protection. In case of fire: Use dry sand or D-powder to extinguish.

**Special labelling of particular preparations:**

not applicable

**2.3. Other hazards**

Dust clouds may form explosive mixture with air. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat.

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

**3.1. Substances**

not applicable

**3.2. Mixtures**

Mixture related information

**Composition/information on ingredients**

| Substance: | CAS-No.:  | REACH-no.:            | Concentration: | Classification: EC 1272/2008 (CLP):             | M, ATE, Note |
|------------|-----------|-----------------------|----------------|---|--------------|
| Iron       | 7439-89-6 | 01-2119462838-24-XXXX | max.0,25%      | -   | M = 1        |
| Titanium   | 7440-32-6 | 01-2119484878-14-XXXX | Balance        | Flam. Sol. 1/2, H228                            |              |
| Aluminium  | 7429-90-5 | 01-2119529243-45-XXXX | 5,50-6,50%     | Flam. Sol. 1/2, H228;<br>Water-react. 2/3, H261 | M = 0        |
| Vanadium   | 7440-62-2 | 01-2119537418-34-XXXX | 3,50-4,50%     | -   |              |

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

**SECTION 4: First aid measures**

**4.1. Description of first aid measures**

**General information:** In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

**In case of inhalation:** Move victim to fresh air. Put victim at rest and keep warm.

Seek medical attention if problems persist.

**Following skin contact:** After contact with skin, wash immediately with plenty of water and soap. In case of skin irritation, consult a physician.

**After eye contact:** In case of contact with eyes, rinse immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart.

Seek medical attention if problems persist.

**After ingestion:** Rinse mouth immediately and drink plenty of water. Consult an ophthalmologist.

**4.2. Most important symptoms and effects, both acute and delayed**

No known symptoms to date.

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

Treat symptomatically.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

**Suitable extinguishing media** Dry sand. D powder.  
**Unsuitable extinguishing media** Water fog. High power water jet. Water. Foam. Carbon dioxide (CO<sub>2</sub>).

### 5.2. Special hazards arising from the substance or mixture

Vapours may form explosive mixtures with air.

### 5.3. Advice for firefighters

#### General information

Co-ordinate fire-fighting measures to the fire surroundings.

#### Special protective equipment for fire-fighters:

In case of fire: Wear self-contained breathing apparatus.

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## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

Wear personal protection equipment.  
Remove persons to safety.  
Provide adequate ventilation.

### 6.2. Environmental precautions

Do not allow to enter into surface water or drains.

### 6.3. Methods and material for containment and cleaning up

Use approved industrial vacuum cleaner for removal. Avoid dust formation. Ventilate affected area.

### 6.4. Reference to other sections

Safe handling: see section 7  
Personal protection equipment: see section 8  
Disposal: see section 13

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## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

#### Advices on safe handling

Avoid contact with skin and eyes. Avoid generation of dust. Do not breathe dust.

#### Precautions against fire and explosion:

Take precautionary measures against static discharges.

### 7.2. Conditions for safe storage, including any incompatibilities

#### Requirements for storage rooms and vessels

Keep container tightly closed in a cool, well-ventilated place. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

### Hints on joint storage

Keep away from food, drink and animal feedingstuffs.  
Do not store together with acids, oxidizing agents, alkalis.

## 7.3. Specific end use(s)

none

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### occupational exposure limit value

| Substance:                  | CAS-No.:  | Source:                                | Occupational exposure limit value:[ppm] | Occupational exposure limit value:[mg/m <sup>3</sup> ] | Limitation of exposure peaks: | Remark: |
|-----------------------------|-----------|--|---|--|-------------------------------|---------|
| Aluminium (Inhalable Dust)  | 7429-90-5 | Workplace Exposure Limit (UK HSE EH40) |   | 10   |                               |         |
| Aluminium (Respirable Dust) | 7429-90-5 | Workplace Exposure Limit (UK HSE EH40) |   | 4  |                               |         |

#### DNEL-/PNEC-values

##### DNEL value

| Substance: | CAS-No.:  | DNEL/DMEL  |
|------------|-----------|--|
| Titanium   | 7440-32-6 | population oral longterm, systemic 350 mg/kg bw/day  |
| Aluminium  | 7429-90-5 | worker inhalative longterm, systemic 3,72 mg/m <sup>3</sup><br>worker inhalative longterm, local 3,72 mg/m <sup>3</sup><br>population oral longterm, systemic 7,9 mg/kg bw/day |
| Iron       | 7439-89-6 | worker inhalative longterm, local 3 mg/m <sup>3</sup><br>population inhalative longterm, local 1,5 mg/m <sup>3</sup>   |

##### PNEC Value

| Substance: | CAS-No.:  | PNEC  |
|------------|-----------|---|
| Titanium   | 7440-32-6 | aquatic, freshwater 0,076 mg/l<br>aquatic, marine water 0,6 mg/l<br>sewage treatment plant 60 mg/l<br>sediment, freshwater 600 mg/kg dw<br>sediment, marine water 60 mg/kg dw<br>soil 60 mg/kg dw   |
| Vanadium   | 7440-62-2 | aquatic, freshwater 7,6 µg/l<br>aquatic, marine water 2,5 µg/l<br>sewage treatment plant 450 µg/l<br>sediment, freshwater 240 mg/kg dw<br>sediment, marine water 79 mg/kg dw<br>soil 7,2 mg/kg dw<br>secondary poisoning 0,167 mg/kg food |

#### Additional information

none

### 8.2. Exposure controls

#### Occupational exposure controls:

Provide adequate ventilation as well as local exhaustion at critical locations.  
Technical measures and the application of suitable work processes have priority over personal protection equipment.

#### General protection and hygiene measures:

When using do not eat, drink, smoke, sniff.  
Wash hands before breaks and after work.  
Apply skin care products after work.

Wash contaminated clothing prior to re-use.

#### Personal protection equipment

Minimum standard for preventive measures while handling with working materials are specified in the TRGS 500.

#### Respiratory protection

Respiratory protection necessary at: In the case of the formation of dust. Suitable respiratory protection apparatus: particulates filter device (DIN EN 143).

#### Hand protection

Tested protective gloves are to be worn:  
DIN-/EN-Norms:  
EN ISO 374

#### Eye/face protection

Tightly sealed safety glasses.

#### Body protection:

Wear suitable protective clothing.

#### Environmental exposure controls

refer to chapter 7. No further action is necessary.

#### Consumer exposure controls

refer to chapter 7. No further action is necessary.

#### Exposure Scenario:

none

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## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

#### Appearance

|                  |                |
|------------------|----------------|
| Physical state:  | solid: Powder  |
| Colour:          | grey           |
| Odour:           | odourless      |
| Odour threshold: | not applicable |

#### Safety relevant basis data

|  |                   |
|--|-------------------|
| Melting point/freezing point:            | 1660 °C (3260 °F) |
| Initial boiling point and boiling range: | 3287 °C (5949 °F) |
| Flammability:                            | Flammable         |
| lower flammability or explosive limits:  | Not available.    |
| Upper flammability or explosive limits:  | Not available.    |
| Flash point:                             | Not applicable.   |

|  |                       |
|--|-----------------------|
| <b>Ignition temperature:</b>                   | Not applicable.       |
| <b>Decomposition temperature:</b>              | Not available.        |
| <b>pH:</b>                                     | Not applicable.       |
| <b>Kinematic viscosity:</b>                    | Not applicable.       |
| <b>Water solubility (g/L):</b>                 | Insoluble.            |
| <b>Partition coefficient: n-octanol/water:</b> | Not applicable.       |
| <b>Vapour pressure:</b>                        | Not applicable.       |
| <b>Density:</b>                                | 4,5 g/cm <sup>3</sup> |
| <b>Relative density:</b>                       | Not applicable.       |
| <b>Particle properties:</b>                    | Not available.        |

## 9.2. Other information

Minimum ignition energy (MIE): 24 mJ (Data from -45+15 um powder)  
Dust deflagration index (Kst): 42 bar•m/s  
Dust explosive classes: ST 1  
Maximum explosion pressure (Pmax): 5.81 barg  
Maximum rate of pressure rise ((dP/dt)max): 155  
Minimum Explosible Concentration (MEC): 60<MEC<80 g/m<sup>3</sup>  
Limiting Oxidant Concentration (LOC): 7.5 %O<sub>2</sub>  
Minimum Ignition Temperature of a Dust Cloud (MAIT): 750 °C  
Minimum Ignition Temperature of a Dust Layer (MIT): >450 °C

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

This material is considered to be non-reactive under normal use conditions.

### 10.2. Chemical stability

With proper storage and handling the product is stable.

### 10.3. Possibility of hazardous reactions

No hazardous reaction when handled and stored according to provisions.

### 10.4. Conditions to avoid

Keep away from heat and direct sunlight. Avoid contact with moisture.

### 10.5. Incompatible materials

Strong oxidising agents, Acids, Alkaline.

### 10.6. Hazardous decomposition products

No further relevant information available.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

|                               |                     |                                     |                     |
|-------------------------------|---------------------|-------------------------------------|---------------------|
| <b>M-factor:</b>              | -                   | <b>Acute toxicity (dermal):</b>     | Low acute toxicity. |
| <b>Acute toxicity (oral):</b> | Low acute toxicity. | <b>Acute toxicity (inhalative):</b> | Low acute toxicity. |

### Acute toxicity

| Substance: | CAS-No.:  | Toxicological information  |
|------------|-----------|--|
| Iron       | 7439-89-6 | LD50 oral (rat) 30000 mg/kg  |
| Aluminium  | 7429-90-5 | LC50 inhalation (Rat) > 888 mg/l/4 h<br>LC50 fish (96 h) 1,55 mg/l<br>LD50 oral (rat) > 2000 mg/kg |

### Skin corrosion/irritation:

Dust may cause irritation.

### Serious eye damage/irritation:

Dust may cause irritation.

### Respiratory or skin sensitisation:

not sensitising.

### CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)

#### Carcinogenicity:

No indications of human carcinogenicity exist.

#### Germ cell mutagenicity:

No indications of human germ cell mutagenicity exist.

#### Reproductive toxicity:

No indications of human reproductive toxicity exist.

### STOT-single exposure:

None anticipated.

### STOT-repeated exposure:

None anticipated.

## 11.2. Information about other hazards

Not classified.

## SECTION 12: Ecological information

### 12.1. Toxicity

Toxicity - Aquatic invertebrates: Low toxicity to invertebrates.

Toxicity - Fish: Low toxicity to fish.

Toxicity - Algae: Low toxicity to algae.

Toxicity - Sediment Compartment: Not classified.

Toxicity - Terrestrial Compartment: Not classified.

### Ecotoxicity

| Substance: | CAS-No.:  | Ecotoxicity                |
|------------|-----------|----------------------------|
| Iron       | 7439-89-6 | LC50 fish (96 h) 1,29 mg/l |
| Aluminium  | 7429-90-5 | LC50 fish (96 h) 1,55 mg/l |

### 12.2. Persistence and degradability

The methods for determining the biological degradability are not applicable to inorganic substances.

### 12.3. Bioaccumulative potential

No data.

### 12.4. Mobility in soil

Insoluble in water. The product is predicted to have low mobility in soil.

## 12.5. Results of PBT and vPvB assessment

This substance does not meet the criteria for classification as PBT or vPvB.

## 12.6 Endocrine disruptive effect

No data.

## 12.7. Other adverse effects

No data.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

#### Appropriate disposal/Product:

Dispose of waste according to applicable legislation.

#### Appropriate disposal / Package

Handle contaminated packages in the same way as the substance itself.

#### List of proposed waste codes / waste designations according to EWC / AVV

EU waste code: 17 04 07 mixed metals.

## SECTION 14: Transport information

### 14.1. UN number

UN No.: 3089

### 14.2. UN proper shipping name

#### Land transport (ADR/RID)

ENTZÜNDBARES METALLPULVER, N.A.G. (Titan)

#### Sea transport (IMDG), Air transport (ICAO-TI / IATA-DGR)

METAL POWDER, FLAMMABLE, N.O.S. (Titanium)

### 14.3. Transport hazard class(es)

Hazard label(s) / Label: 4.1

Classification code: / Classification Code: F3



### 14.4. Packing group

Packing group/ Packing Group: II

### 14.5. Environmental hazards

ADR/RID / IMDG / ICAO-TI / IATA-DGR:  
Marine pollutant:

Yes

No

#### 14.6. Special precautions for user

##### Land transport (ADR/RID)

|                     |     |                          |      |
|---------------------|-----|--------------------------|------|
| transport category: | 2   | tunnel restriction code: | E    |
| Special provisions: | 552 | Limited quantity (LQ):   | 1 kg |

##### Sea transport (IMDG)

EmS-No: F-G, S-G

Special provisions: Limited quantity (LQ): 1 kg

#### 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Remark none

### SECTION 15: Regulatory information

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

##### EU legislation

##### Candidate List of Substances of Very High Concern for Authorisation

Not listed.

##### REACH: ANNEX XIV list of substances subject to authorisation

Not listed.

##### REACH: Annex XVII Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not listed.

##### Community Rolling Action Plan (CoRAP)

Not listed.

##### Regulation (EC) N° 850/2004 of the European Parliament and of the Council on persistent organic pollutants

Not listed.

##### Regulation (EC) N° 2037/2000 on substances that deplete the ozone layer

Not listed.

##### Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals

Not listed.

##### National regulations

Observe in addition any national regulations!

#### 15.2. Chemical Safety Assessment

For this substance a chemical safety assessment has not been carried out.

### SECTION 16: Other information

**Relevant H- and EUH-phrases (Number and full text):**

**Hazard statements**

H228 Flammable solid.  
H261 In contact with water releases flammable gases.

**Training advice**

none

**Recommended restrictions of use:**

Reserved for industrial and professional use.

**Further remarks:**

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**Documentation of changes:**

none

**Key literature references and sources for data**

Data arise from reference works and literature.  
Information of suppliers.

**Abbreviations and acronyms**

For abbreviations and acronyms, see table at <http://abbrev.esdscom.eu>