

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

### 1.1. Product identifier

**m4p™ 316l**

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

**Relevant identified uses:** Stainless steel powder for additive manufacturing; powder metallurgy  
**Uses advised against:** No information available

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

#### Supplier

m4p material solutions GmbH  
Mittelweg 13  
D-39130 Magdeburg

**Telephone** +49 (0)177 8036000  
**Telefax:** +49 (0)391 7214941

#### Information contact

Herr Dr. Andreas Pelz

**Information telephone** +49 (0)177 8036000  
**Information telefax** +49 (0)391 7214941  
**E-mail (competent person)** a.pelz@metals4printing.com  
**Website** www.metals4printing.com

### 1.4. Emergency telephone number

Euro Emergency number

**Telephone** 112

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

Regulation (EC) No 1272/2008:

Skin Sens. 1/1A/1B, H317; Carc. 2, H351; STOT RE 1, H372; Aquatic Chronic 3, H412

### 2.2. Label elements

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

**Hazard pictograms**



GHS07, GHS08  
Danger

**Signal word:**

**Hazard statements:**

H317 May cause an allergic skin reaction.

H351 Suspected of causing cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard).

H372 Causes damage to organs (or state all organs affected, if known) through prolonged or repeated exposure (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard).

H412 Harmful to aquatic life with long lasting effects.

**Precautionary statements:**

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.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P264	Wash hands thoroughly after handling with water.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P302+352	IF ON SKIN: Wash with plenty of water.
P308+313	IF exposed or concerned: Get medical advice/attention.
P314	Get medical advice/attention if you feel unwell.
P321	Specific treatment (see .? on this label).
P333+313	If skin irritation or rash occurs: Get medical advice/attention.
P362+364	Take off contaminated clothing and wash it before reuse.
P405	Store locked up.
P501	Dispose of contents/container to waste disposal.

**Hazardous component(s) for labelling:**

Nickel

**2.3. Other hazards**

No information available

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

**3.1. Substances**

not applicable

**3.2. Mixtures**

Mixture related information

**Composition/information on ingredients**

Substance:	EC-no.:	CAS-No.:	Concentration:	Classification: EC 1272/2008 (CLP):
Manganese	231-105-1	7439-96-5	max. 2,0	Flam. Sol. 1/2, H228
Silicon	231-130-8	7440-21-3	max. 1,0	-
Iron	231-096-4	7439-89-6	Basis	-
Molybdenum	231-107-2	7439-98-7	2,0-3,0	-
Chromium	231-157-5	7440-47-3	16,0-18,0	-
Nickel	231-111-4	7440-02-0	11,0-14,0	Skin Sens. 1/1A/1B, H317; Carc. 2, H351; STOT RE 1, H372; Aquatic Chronic 3, H412

(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:** Provide fresh air.  
In case of respiratory tract irritation, consult a physician.

**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.  
Seek medical attention if problems persist.

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

Allergic reactions

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

Treat symptomatically.

---

### **SECTION 5: Firefighting measures**

#### **5.1. Extinguishing media**

<b>Suitable extinguishing media</b>	D -powder Sand
<b>Unsuitable extinguishing media</b>	Full water jet Foam Carbon dioxide (CO <sub>2</sub> )

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

none

#### **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.

---

### **SECTION 6: Accidental release measures**

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

Wear personal protection equipment.

Remove persons to safety.

#### **6.2. Environmental precautions**

Do not allow to enter into surface water or drains.

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

Take up mechanically, placing in appropriate containers for disposal. Avoid generation of dust. Treat the recovered material as prescribed in the section on waste disposal. Avoid generation of dust. Provide

adequate ventilation.

#### 6.4. Reference to other sections

Safe handling: see section 7

Personal protection equipment: see section 8

Disposal: see section 13

## 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:

Usual measures for fire prevention.

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

#### Requirements for storage rooms and vessels

Keep container tightly closed.

#### Hints on joint storage

Keep away from food, drink and animal feedingstuffs.

### 7.3. Specific end use(s)

No information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### occupational exposure limit

Substance:	CAS-Nr.:		Source:	occupational exposure limit:[mg/m <sup>3</sup> ]	Limit:	Comment:
Nickel	7440-02-0	De	TRGS 900	0,006 A	8(II)	AGS, 24, Sh, Y
Chromium	7440-47-3	De	TRGS 900	2 E	1(I)	EU, 10
Manganese	7439-96-5	De	TRGS 900	0,02 A; 0,2 E	8(II)	DFG, Y, 10,20

#### DNEL-/PNEC-values

##### DNEL value

Substance:	CAS-No.:	DNEL/DMEL
Nickel	7440-02-0	worker inhalative long-term, systemic 0,05 mg/m <sup>3</sup> worker inhalative long-term, local 0,05 mg/m <sup>3</sup> worker inhalative short-term, local 11,9 mg/m <sup>3</sup> worker dermal long-term, local 0,035 mg/kg bw/day population inhalative long-term, systemic 60 xxx(ng/m <sup>3</sup> ) population inhalative long-term, local 60 xxx(ng/m <sup>3</sup> ) population inhalative short-term, local 0,8 mg/m <sup>3</sup> population dermal long-term, local 0,035 xxx(mg/cm <sup>2</sup> ) population oral long-term, systemic 0,011 mg/kg bw/day population oral short-term, systemic 0,37 mg/kg bw/day
Chromium	7440-47-3	worker inhalative long-term, local 0,5 mg/m <sup>3</sup> population inhalative long-term, local 0,027 mg/m <sup>3</sup>
Manganese	7439-96-5	worker inhalative long-term, systemic 0,2 mg/m <sup>3</sup> worker dermal long-term, systemic 0,004 mg/kg bw/day population inhalative long-term, systemic 0,041 mg/m <sup>3</sup> population inhalative long-term, local 0,041 mg/m <sup>3</sup> population dermal long-term, systemic 0,002 mg/kg bw/day

### PNEC Value

Substance:	CAS-No.:	PNEC
Nickel	7440-02-0	aquatic, freshwater 7,1 µg/l intermittent release, freshwater 0 xxx(ng/l) aquatic, marine water 8,6 µg/l intermittent release, marine water 0 xxx(ng/l) sediment, freshwater 109 mg/kg dw sediment, marine water 109 mg/kg dw soil 29,9 mg/kg dw secondary poisoning 120 µg/kg food
Chromium	7440-47-3	aquatic, freshwater 6,5 µg/l sediment, freshwater 205,7 mg/kg dw soil 21,1 mg/kg dw
Manganese	7439-96-5	aquatic, freshwater 0,034 mg/l intermittent release, freshwater 0,028 mg/l aquatic, marine water 0,003 mg/l sediment, freshwater 3,3 mg/kg dw sediment, marine water 0,34 mg/kg dw soil 3,4 mg/kg dw

### Additional information

none

## 8.2. Exposure controls

### Occupational exposure controls:

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

Only wear fitting, comfortable and clean protective clothing.

### Respiratory protection

Respiratory protection necessary at: In the case of the formation of dust.  
Recommended filtertyp: P2

### Hand protection

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

### Eye/face protection

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

---

## 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**

**pH:** not applicable  
**Melting point/freezing point:** 1400-1430°C  
**Initial boiling point and boiling range:** not applicable  
**Flash point:** not applicable  
**Flammability (solid, gas):** not flammable  
**Explosivity:** not explosive.  
**Relative density:** 7,9-8,0 g/cm<sup>3</sup>  
**Density:** 7,9-8,0 g/cm<sup>3</sup>  
**Water solubility (g/L):** practically insoluble  
**Ignition temperature:** not self-igniting

### 9.2. Other information

none

---

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

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

### 10.2. Chemical stability

The substance is chemically stable under recommended conditions of storage, use and temperature.

### 10.3. Possibility of hazardous reactions

No data available

### 10.4. Conditions to avoid

The product in the delivered form is not dust explosion capable; the enrichment of fine dust however leads to the danger of dust explosion.

### 10.5. Incompatible materials

Acids. Oxidizing-and Reducing agents.

### 10.6. Hazardous decomposition products

Metal oxides

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

There are no data available on the preparation/mixture itself.

**M-factor:** Not applicable  
**Acute toxicity (oral):** Not applicable  
**Acute toxicity (dermal):** Not applicable  
**Acute toxicity (inhalative):** Not applicable

#### Acute toxicity

Substance:	CAS-No.:	Toxicological information
Iron	7439-89-6	LD50 oral (rat) 30000 mg/kg

#### Skin corrosion/irritation:

Not an irritant.

#### Serious eye damage/irritation:

Not an irritant.

#### Respiratory or skin sensitisation:

May cause an allergic skin reaction.

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

Carcinogenicity:

Category 3 (EU): There is well-founded concern about the possible carcinogenic effects on human beings.

Germ cell mutagenicity:

No information available.

Reproductive toxicity:

No information available.

#### STOT-single exposure:

No information available.

#### STOT-repeated exposure:

No information available.

#### Aspiration hazard:

Not an irritant.

## SECTION 12: Ecological information

### 12.1. Toxicity

There are no data available on the mixture itself.

#### Ecotoxicity

Substance:	CAS-No.:	Ecotoxicity
Chromium	7440-47-3	LC50 fish (96h) MW 40,5 m LC50 shellfish (48h) MW 0,53 mg/l EC50 shellfish (48h) 0,07 mg/l EC50 seaweed (72h) MW 8,75 mg/l
Nickel	7440-02-0	LC50 fish (96h) 40 mg/l LC50 shellfish (48h) 8,85 mg/l EC50 shellfish (48h) 1 mg/l
Iron	7439-89-6	LC50 fish (96h) 1,29 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 information available.

## 12.4. Mobility in soil

No information available.

## 12.5. Results of PBT and vPvB assessment

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

## 12.6. Other adverse effects

No information available.

---

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

#### Appropriate disposal/Product:

Waste disposal according to EC Directives 75/442/EEC and 91/689/EEC on waste and hazardous waste in their latest versions.

#### Appropriate disposal / Package

Non-contaminated packages may be recycled.

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

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

According to EAKV, allocation of waste identity numbers/waste descriptions must be carried out in a specific way for every industry and process.

**Waste key product:** 12 01 02 - ferrous metal dust and particles

**Waste key packaging:** 15 01 02 - plastic packaging

---

## SECTION 14: Transport information

### 14.1. UN number

UN No.: Not regulated

### 14.2. UN proper shipping name

#### Land transport (ADR/RID)

Not regulated

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

Not regulated

### 14.3. Transport hazard class(es)

Hazard label(s) / Label:	N/A	Classification code: / Classification Code:	N/A
--------------------------	-----	---	-----



#### 14.4. Packing group

Packing group/ Packing Group: N/A

#### 14.5. Environmental hazards

ADR/RID / IMDG / ICAO-TI / IATA-DGR:	Yes	No
Marine pollutant:	<input type="checkbox"/>	<input checked="" type="checkbox"/>

#### 14.6. Special precautions for user

Land transport (ADR/RID)

transport category:	N/A	tunnel restriction code:	N/A
Special provisions:	N/A	Limited quantity (LQ):	N/A

Sea transport (IMDG)

EmS-No: N/A

Special provisions: N/A Limited quantity (LQ): N/A

#### 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

Information on Regulation (EC) No 166/2006 establishing a European Pollutant Release and Transfer Register:  
not relevant

Regulation (EC) No. 1005/2009 on substances that lead to the depletion of the ozone layer:  
not relevant

Regulation (EC) No. 648/2004 (Detergents regulation)  
not relevant

Regulation (EC) No 850/2004 [POP-Regulation]:  
not relevant

Regulation (EU) No 649/2012 on the export and import of dangerous chemicals:  
not relevant

Use restriction according to REACH annex XVII, no.:  
Number 27: Nickel and nickelcompounds

##### National regulations

Observe in addition any national regulations!

Restrictions of occupation  
none

Other regulations, restrictions and prohibition regulations  
none

## 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

- H317 May cause an allergic skin reaction.  
H351 Suspected of causing cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard).  
H372 Causes damage to organs (or state all organs affected, if known) through prolonged or repeated exposure (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard).  
H412 Harmful to aquatic life with long lasting effects.

#### Training advice

none

#### Recommended restrictions of use:

refer to chapter 1.

#### Further remarks:

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

#### Documentation of changes:

none

#### Key literature references and sources for data

Data arise from reference works and literature.