# Hot-dip galvanised steel pipe or bend with threaded sleeve

**iBVD**

**Dokument Id**
5566815519-00125
**Version**
1

**Skapad**
2021-08-13
**Publicerad**
2021-08-13

*Uppgiftslämnaren reserverar sig för eventuella fel i produktinformationen eller felaktigt registrerade uppgifter och förbehåller sig rätten att korrigera och/eller komplettera produktinformation utan föregående avisering*

## 1 GRUNDDATA

**Varubeskrivning**

Hot-dip galvanised steel pipe or bend with threaded sleeve

**Övriga upplysningar**

**Klassificeringar**

| | |
|---|---|
| ETIM › | |
| BK04 › | |
| BSAB › | |
| UNSPSC › | |

### Leverantörsuppgifter

**Företagsnamn**
OBO Bettermann AB

**Organisationsnummer**
5566815519

**Adress**

**Hemsida**
www.obobettermann.se

**Miljökontaktperson**

**Namn**
Matthew Wise

**Telefon**
+46 73-423 24 75

**E-post**
wise.matthew@obobettermann.se

## 2 HÅLLBARHETSARBETE

### Företagets certifiering

- ISO 9000
- ISO 14000

## Policys och riktlinjer

# 3 INNEHÅLLSDEKLARATION

| | |
|---|---|
| **Kemisk produkt** | Nej |
| **Omfattas varan av RoHs-direktivet** | Nej |
| **Innehåller produkten tillsatt nanomaterial, som är medvetet tillsatta för att uppnå en viss funktion** | Nej |
| **Varans vikt** | 0,104 - 9,741 kg |

## Vara / Delkomponenter

**Koncentrationen har beräknats på komponentnivå**

Pipe - Steel - 73,8% - 92,7% av hela varan

| Ingående material /komponenter | Vikt-% i komponent | CAS-nr (alt legering) | EG-nr (alt legering) | Vikt % i produkt | Kommentar |
|---|---|---|---|---|---|
| Steel - DIN EN 10139 DC 01 (St 12) 1.0330 | 100% | | | 73,8 - 92,7% | |

Pipe - Galvanizing mixture - 6% av hela varan

| Ingående material /komponenter | Vikt-% i komponent | CAS-nr (alt legering) | EG-nr (alt legering) | Vikt % i produkt | Kommentar |
|---|---|---|---|---|---|
| ELECTROLYT-FINE ZINC 99.995 Pr. | 33,3% | | | 1,998% | |
| Fine zinc-nickel 0.5% nickel | 33,3% | | | 1,998% | |
| SECONDARY ZINC R1 | 16,7% | | | 1,002% | |
| SECONDARY ZINC R2 | 16,7% | | | 1,002% | |

Threaded sleeve - Electrogalvanised steel - 1,3% - 20,2% av hela varan

| Ingående material /komponenter | Vikt-% i komponent | CAS-nr (alt legering) | EG-nr (alt legering) | Vikt % i produkt | Kommentar |
|---|---|---|---|---|---|
| Steel - DIN EN 10139 DC 01 (St 12) 1.0330 Surface - DIN 50979 Fe//ZnNi8//An//T2 | 100% | | | 1,3 - 20,2% | |

**Del av materialinnehållet som är deklarerat** 100%

## Särskilt farliga ämnen

Varan innehåller INTE några ämnen med särskilt farliga egenskaper (Substances of very high concern, SVHC-ämnen) som finns med på kandidatförteckningen i en koncentration som överstiger 0,1 vikts-%

**Utgåva av kandidatförteckningen som har använts**
2021-01-22 00:00:00

### Övrigt

Ämnen är redovisade ned till 0.01 viktprocent enligt iBVDs redovisningskrav. Eventuell avvikelse från redovisningskraven redovisas nedan

**Kompletterande information**

Se bifogade säkerhetsdatablad

## 4 RÅVAROR

### Återvunnet material

**Innehåller varan återvunnet material:** Nej

### Träråvara

**Träråvara ingår i varan:** Nej

## 5 MILJÖPÅVERKAN

**Finns en miljövarudeklaration framtagen enligt EN15804 eller ISO14025 för varan**

Nej

**Finns annan miljövarudeklaration**

Nej

## 6 DISTRIBUTION

**Beskrivning av emballagehantering för distribution av varan**

The main packaging is made of paper/cardboard. In addition, PE film or PE bags are sometimes used as protective packaging.

## 7 BYGGSKEDET

| | |
|---|---|
| **Ställer varan särskilda krav vid lagring?** | Nej |
| **Ställer varan särskilda krav på omgivande byggvaror?** | Nej |

## 8 BRUKSSKEDET

| | |
|---|---|
| **Finns skötselanvisningar/skötselråd?** | Nej |
| **Finns en energimärkning enligt energimärkningsdirektivet (2010/30/EU) för varan?** | Ej relevant |

## 9 RIVNING

| | |
|---|---|
| **Kräver varan särskilda åtgärder för skydd av hälsa och miljö vid rivning/demontering?** | Nej |

## 10 AVFALLSHANTERING

| | |
|---|---|
| **Omfattas den levererade varan av förordningen (2014:1075) om producentansvar för elektriska och elektroniska produkter när den blir avfall?** | Nej |
| **Är återanvändning möjlig för hela eller delar av varan?** | Nej |
| **Är materialåtervinning möjlig för hela eller delar av varan?** | Ja |

Components can be recycled.

| | |
|---|---|
| **Är energiåtervinning möjlig för hela eller delar av varan?** | Nej |
| **Har leverantören restriktioner och rekommendationer för återanvändning, material- eller energiåtervinning eller deponering?** | Nej |
| **När den levererade varan blir avfall, klassas den då som farligt avfall?** | Nej |
| **Avfallskod (EWC) för den levererade varan** | 170405 |

# 11 ARTIKELIDENTITETER

| E-nummer | Leverantörens artikelnummer | GTIN |
|---|---|---|
| 14 031 56 | 2046533 | 4012195781424 |
| 14 031 57 | 2046534 | 4012195781431 |
| 14 031 58 | 2046535 | 4012195781448 |
| 14 031 59 | 2046536 | 4012195781486 |
| 14 031 62 | 2046537 | 4012195781493 |
| 14 031 63 | 2046538 | 4012195781509 |
| 14 031 64 | 2046540 | 4012195781547 |
| 14 031 65 | 2046786 | 4012196387588 |
| 14 031 66 | 2046787 | 4012196387595 |
| 14 031 67 | 2046788 | 4012196387601 |
| 14 031 68 | 2046789 | 4012196387632 |
| 14 031 69 | 2046790 | 4012196387649 |
| 14 031 71 | 2046791 | 4012196387656 |
| 14 031 73 | 2046792 | 4012196387663 |

## 12 Bilagor

| | |
|---|---|
| **Produktdatablad** | 01-190VBS pipe systems.pdf |
| **Prestandadeklaration** | |
| **Säkerhetsblad** | |
| **Miljövarudeklaration** | |
| **Skötselanvisning** | |

**Övriga bifogade dokument**

-2018 - 08 SDB Zinc Version 2 (en).pdf
-SDS_10498542_U-Zink englisch - Juli 2020.pdf
-U-Zink englisch - Juli 2020.pdf
-Zink-Nickel-Legierung - englisch - Juli 2021.pdf

# Pipe systems

# IEC classification in accordance with DIN EN 61386-1

The OBO Bettermann pipe systems are machined and tested according to DIN EN 61386 (Electrical installation pipe systems for electrical energy and information) and DIN EN 60423 (External diameters of electrical installation pipes and thread for electrical installation pipes and their accessories).

**Numeric code**
DIN EN 61386-1 classifies installation pipes using a 12-digit numeric code, which provides information on the pressure resistance, impact resistance or use temperatures. You can find the first five digits in the product descriptions of the pipe systems.

**First digit**
Compression resistance

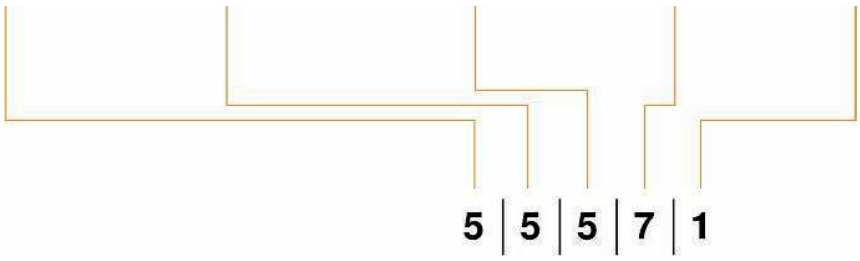
**Second digit**
Impact resistance

**Third digit**
Minimum use temperature

**Fourth digit**
Maximum use temperature

**Fifth digit**
Bending resistance

| | First digit | | Second digit | | Third digit | | Fourth digit | | Fifth digit |
|---|---|---|---|---|---|---|---|---|---|
| | **Pressure resistance** | | **Impact resistance** | | **Minimum use temperature** | | **Maximum use temperature** | | **Bending behaviour** |
| **1** | Very light (125 N) | **1** | Very light (0.5 kg/100 mm) | **1** | + 5 °C | **1** | + 60 °C | 1 | Rigid |
| **2** | Light (320 N) | **2** | Light (1.0 kg/100 mm) | **2** | – 5 °C | **2** | + 90 °C | **2** | Bendable |
| **3** | Medium (750 N) | **3** | Medium (2.0 kg/100 mm) | **3** | – 15 °C | **3** | + 105 °C | **3** | Bendable, self-healing |
| **4** | Heavy (1250 N) | **4** | Heavy (2.0 kg/300 mm) | **4** | – 25 °C | **4** | + 120 °C | **4** | Flexible |
| 5 | Very heavy (4000 N) | 5 | Very heavy (6.8 kg/300 mm) | 5 | – 45 °C | **5** | + 150 °C | | |
| | | | | | | **6** | + 250 °C | | |
| | | | | | | 7 | + 400 °C | | |










Always indicate the item number when ordering.

# Electrical installation pipes

## Classification according to IEC EN 61386-1: Corrosion protection

| | 9th digit | |
|---|---|---|
| | **Resistance against corrosion** | **Suitable surfaces** |
| **1** | Low protection, inside and outside | |
| **2** | Medium protection, inside and outside | • Painted black (SW)<br>• Electrogalvanised (G)<br>• Strip galvanised (FS) |
| **3** | Medium protection inside, high protection outside | |
| **4** | High protection, inside and outside | • Hot-dip galvanised (FT)<br>• Stainless steel (V2A, V4A) |


**Protection against mechanical loads**
OBO metal pipes are particularly suited to use under tough industrial conditions. They provide reliable protection against very heavy mechanical loads during cable routing.

The different material and surface qualities, from galvanised to painted, allow perfect adaptation to the requirements of the appropriate environment.

**Maintenance of electrical function to E30/E90**
Our steel pipes guarantee the maintenance of electrical function to E30/E90. They are thus ideal for the connection of safety-relevant equipment, such as fire alarm systems.

## Electrogalvanised threaded pipe

- VDE-tested
- Trimmed weld
- Internally galvanised



## Electrogalvanised plug-in pipe

- VDE-tested
- Trimmed weld
- Galvanised inside



## Black, powder-coated Threaded pipe

- VDE-tested
- Trimmed weld



## Black, powder-coated Plug-in pipe

- VDE-tested
- Trimmed weld



## Hot galvanised threaded pipe

- VDE-tested
- Trimmed weld
- High corrosion protection
- Zinc/nickel sleeve



## Hot galvanised plug-in pipe

- VDE-tested
- Trimmed weld
- High corrosion protection



## Stainless steel pipe, V2A

- VDE-tested
- Brushed surface









Always indicate the item number when ordering.

## Stainless steel plug-in pipe, V4A

- VDE-tested
- Brushed surface

## Aluminium threaded pipe

- VDE-tested

## Aluminium plug-in pipe

- VDE-tested

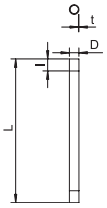
## Accessories

- Wide range of application options

## Quick pipe

- Innovative system
- VDE-tested
- Reclosable

## Electrogalvanised steel pipe, with thread




5 | 5 | 5 | 7 | 1

M E30 E90

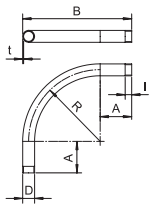
| Type | Thread | Dimension D mm | Dimension L mm | Dimension l mm | Dimension t mm | Pack. m | Weight kg/100 m | Item No. |
|---|---|---|---|---|---|---|---|---|
| **SM16W G** | M16x1,5 | 16 | 3000 | 13 | 1.3 | 30 | 50.390 | **2046861** |
| **SM20W G** | M20x1,5 | 20 | 3000 | 13 | 1.5 | 30 | 66.667 | **2046862** |
| **SM25W G** | M25x1,5 | 25 | 3000 | 18 | 1.5 | 30 | 92.290 | **2046863** |
| **SM32W G** | M32x1,5 | 32 | 3000 | 18 | 1.5 | 21 | 120.000 | **2046864** |
| **SM40W G** | M40x1,5 | 40 | 3000 | 20.5 | 1.5 | 15 | 151.450 | **2046865** |
| **SM50W G** | M50x1,5 | 50 | 3000 | 25 | 1.5 | 15 | 190.000 | **2046866** |
| **SM63W G** | M63x1,5 | 63 | 3000 | 25 | 1.7 | 9 | 287.700 | **2046867** |

St Steel

G Electrogalvanised

Electrical installation pipe according to EN 61386-1 with threaded ends to EN 60423 for mechanical protection of cables.
With burr-free inner wall. One coupling is already screwed onto each pipe.

## Electrogalvanised steel bend, with thread




M E30 E90

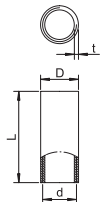
| Type | Thread | Dimension A mm | Dimension B mm | Dimension D mm | Dimension l mm | Dimension R mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|---|---|
| **SBNM16 G** | M16x1,5 | 45 | 103 | 16 | 13 | 50 | 1.4 | 15 | 10.400 | **2046778** |
| **SBNM20 G** | M20x1,5 | 55 | 155 | 20 | 13 | 90 | 1.6 | 25 | 21.000 | **2046779** |
| **SBNM25 G** | M25x1,5 | 68 | 190 | 25 | 18 | 110 | 1.6 | 25 | 33.000 | **2046780** |
| **SBNM32 G** | M32x1,5 | 88 | 254 | 32 | 18 | 150 | 1.6 | 20 | 56.600 | **2046781** |
| **SBNM40 G** | M40x1,5 | 89 | 279 | 40 | 20.5 | 170 | 1.6 | 15 | 77.600 | **2046782** |
| **SBNM50 G** | M50x1,5 | 133 | 358 | 50 | 25 | 200 | 1.6 | 5 | 125.800 | **2046783** |
| **SBNM63 G** | M63x1,5 | 165 | 446 | 63 | 25 | 250 | 1.8 | 3 | 227.000 | **2046784** |

St Steel

G Electrogalvanised

90° bend for electrical installation pipes according to EN 61386-1 with threaded ends to DIN EN 60423. With burr-free inner wall.
One connection sleeve is already screwed onto each pipe bend.

## Electrogalvanised steel sleeve, with thread




M E30 E90

| Type | Thread | Dimension D mm | Dimension d mm | Dimension L mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|
| **SVM16W G** | M16x1,5 | 18.5 | 16 | 26 | 2 | 25 | 2.110 | **2046875** |
| **SVM20W G** | M20x1,5 | 22.5 | 20 | 30 | 2 | 50 | 3.400 | **2046876** |
| **SVM25W G** | M25x1,5 | 27.5 | 25 | 40 | 2 | 50 | 5.030 | **2046877** |
| **SVM32W G** | M32x1,5 | 35.5 | 32 | 40 | 2.5 | 50 | 8.800 | **2046878** |
| **SVM40W G** | M40x1,5 | 43.5 | 40 | 45 | 2.5 | 25 | 11.370 | **2046879** |
| **SVM50W G** | M50x1,5 | 53.5 | 50 | 54 | 2.5 | 10 | 16.970 | **2046880** |
| **SVM63W G** | M63x1,5 | 68 | 63 | 60 | 3.2 | 5 | 30.670 | **2046881** |

St Steel

G Electrogalvanised

Accessory part: coupling with thread according to EN 60423 to connect electrical installation pipes and 90° bends.







Always indicate the item number when ordering.

## Armoured steel pipe without thread, electrogalvanised

E30 E90




4 4 5 7 1

| Type | Dimension D mm | Dimension L mm | Dimension t mm | Pack. m | Weight kg/100 m | Item No. |
|---|---|---|---|---|---|---|
| **S16W G** | 16 | 3000 | 1 | 30 | 37.000 | **2046840** |
| **S20W G** | 20 | 3000 | 1 | 30 | 44.700 | **2046841** |
| **S25W G** | 25 | 3000 | 1.2 | 30 | 70.400 | **2046842** |
| **S32W G** | 32 | 3000 | 1.2 | 21 | 91.200 | **2046843** |
| **S40W G** | 40 | 3000 | 1.2 | 15 | 139.700 | **2046844** |
| **S50W G** | 50 | 3000 | 1.2 | 15 | 176.000 | **2046845** |
| **S63W G** | 63 | 3000 | 1.2 | 9 | 223.000 | **2046846** |

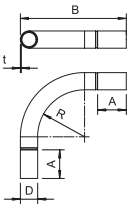
St Steel

G Electrogalvanised

Electrical installation pipe without threaded ends according to EN 61386-1 for mechanical protection of cables. With burr-free inner wall.

## Electrogalvanised steel bend, without thread

E30 E90




| Type | Dimension A mm | Dimension B mm | Dimension D mm | Dimension l mm | Dimension R mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|---|
| **SBN16 G** | 43.7 | 103 | 18.6 | 25 | 50 | 1 | 15 | 7.200 | **2046808** |
| **SBN20 G** | 53.7 | 155 | 22.6 | 30 | 90 | 1 | 25 | 13.300 | **2046809** |
| **SBN25 G** | 66.5 | 190 | 28 | 40 | 110 | 1.2 | 25 | 24.400 | **2046810** |
| **SBN32 G** | 86.5 | 254 | 35.1 | 40 | 150 | 1.2 | 20 | 41.000 | **2046811** |
| **SBN40 G** | 87.2 | 279 | 43.7 | 50 | 170 | 1.5 | 15 | 70.200 | **2046812** |
| **SBN50 G** | 131 | 358 | 54 | 60 | 200 | 1.5 | 5 | 111.800 | **2046813** |
| **SBN63 G** | 163 | 446 | 67 | 90 | 250 | 1.5 | 3 | 174.200 | **2046814** |

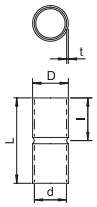
St Steel

G Electrogalvanised

90° bend with moulded sleeves, for electrical installation pipes according to EN 61386-1. With burr-free inner wall.

## Armoured steel pipe connection sleeve without thread, electrogalvanised

E30 E90



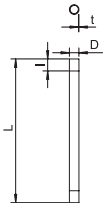

| Type | Dimension D mm | Dimension d mm | Dimension L mm | Dimension l mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|
| **SV16W G** | 18.6 | 16.6 | 50 | 25 | 1 | 25 | 2.400 | **2046854** |
| **SV20W G** | 23.1 | 20.7 | 60 | 30 | 1.2 | 50 | 4.000 | **2046855** |
| **SV25W G** | 28.1 | 25.7 | 60 | 30 | 1.2 | 50 | 5.200 | **2046856** |
| **SV32W G** | 35.2 | 32.8 | 70 | 35 | 1.2 | 50 | 7.200 | **2046857** |
| **SV40W G** | 43.8 | 43.8 | 80 | 40 | 1.5 | 25 | 13.200 | **2046858** |
| **SV50W G** | 54 | 51 | 100 | 50 | 1.5 | 10 | 20.000 | **2046859** |
| **SV63W G** | 67 | 64 | 100 | 50 | 1.5 | 5 | 28.000 | **2046860** |

St Steel

G Electrogalvanised

Accessory part: plug-in sleeve for the connections between electrical installation pipes. With burr-free inner wall.

## Armoured steel pipe with thread, black




5 | 5 | 5 | 6 | 1

M E30 E90

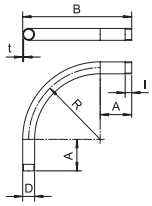
| Type | Thread | Dimension D mm | Dimension L mm | Dimension l mm | Dimension t mm | Colour | Pack. m | Weight kg/100 m | Item No. |
|---|---|---|---|---|---|---|---|---|---|
| **SM16W SW** | M16x1,5 | 16 | 3000 | 13 | 1.3 | Jet black | 30 | 50.000 | **2046500** |
| **SM20W SW** | M20x1,5 | 20 | 3000 | 13 | 1.5 | Jet black | 30 | 73.000 | **2046501** |
| **SM25W SW** | M25x1,5 | 25 | 3000 | 18 | 1.5 | Jet black | 30 | 92.000 | **2046502** |
| **SM32W SW** | M32x1,5 | 32 | 3000 | 18 | 1.5 | Jet black | 21 | 120.000 | **2046503** |
| **SM40W SW** | M40x1,5 | 40 | 3000 | 20.5 | 1.5 | Jet black | 15 | 152.000 | **2046505** |
| **SM50W SW** | M50x1,5 | 50 | 3000 | 25 | 1.5 | Jet black | 15 | 190.700 | **2046506** |
| **SM63W SW** | M63x1,5 | 63 | 3000 | 25 | 1.7 | Jet black | 9 | 287.700 | **2046507** |

St Steel

PE50 PES50 - Polyester/epoxy

Electrical installation pipe according to EN 61386-1 with threaded ends to EN 60423 for mechanical protection of cables.
With burr-free inner wall. One coupling is already screwed onto each pipe.

## Black powder-coated steel bend, with thread




M E30 E90

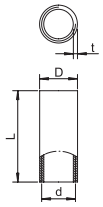
| Type | Thread | Dimension B mm | Dimension D mm | Dimension R mm | Colour | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|
| **SBNM16 SW** | M16x1,5 | 103 | 16 | 50 | Jet black | 15 | 10.400 | **2046793** |
| **SBNM20 SW** | M20x1,5 | 155 | 20 | 90 | Jet black | 25 | 21.000 | **2046794** |
| **SBNM25 SW** | M25x1,5 | 190 | 25 | 110 | Jet black | 25 | 33.000 | **2046795** |
| **SBNM32 SW** | M32x1,5 | 254 | 32 | 150 | Jet black | 20 | 56.600 | **2046796** |
| **SBNM40 SW** | M40x1,5 | 279 | 40 | 170 | Jet black | 15 | 77.600 | **2046797** |
| **SBNM50 SW** | M50x1,5 | 358 | 50 | 200 | Jet black | 5 | 125.800 | **2046798** |
| **SBNM63 SW** | M63x1,5 | 446 | 63 | 250 | Jet black | 3 | 227.000 | **2046799** |

St Steel

PE50 PES50 - Polyester/epoxy

90° bend for electrical installation pipes according to EN 61386-1 with threaded ends to DIN EN 60423. With burr-free inner wall.
One connection sleeve is already screwed onto each pipe bend.

## Black powder-coated steel sleeve, with thread




M E30 E90

| Type | Thread | Dimension D mm | Dimension d mm | Dimension L mm | Dimension t mm | Colour | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|---|
| **SVM16W SW** | M16x1,5 | 18.5 | 16 | 26 | 2 | Jet black | 25 | 2.100 | **2046522** |
| **SVM20W SW** | M20x1,5 | 22.5 | 20 | 30 | 2 | Jet black | 50 | 3.400 | **2046523** |
| **SVM25W SW** | M25x1,5 | 27.5 | 25 | 40 | 2 | Jet black | 50 | 5.000 | **2046524** |
| **SVM32W SW** | M32x1,5 | 35.5 | 32 | 40 | 2.5 | Jet black | 50 | 8.800 | **2046525** |
| **SVM40W SW** | M40x1,5 | 43.5 | 40 | 45 | 2.5 | Jet black | 25 | 11.400 | **2046526** |
| **SVM50W SW** | M50x1,5 | 53.5 | 50 | 54 | 2.5 | Jet black | 10 | 17.000 | **2046527** |
| **SVM63W SW** | M63x1,5 | 68 | 63 | 60 | 3.2 | Jet black | 5 | 30.700 | **2046528** |

St Steel

PE50 PES50 - Polyester/epoxy

Accessory part: coupling with thread according to EN 60423 to connect electrical installation pipes and 90° bends.







Always indicate the item number when ordering.

## Armoured steel pipe without thread, black

E30 E90




4 4 5 6 1

| Type | Dimension D mm | Dimension L mm | Dimension t mm | Colour | Pack. m | Weight kg/100 m | Item No. |
|---|---|---|---|---|---|---|---|
| **S16W SW** | 16 | 3000 | 1 | Jet black | 30 | 37.000 | **2046565** |
| **S20W SW** | 20 | 3000 | 1 | Jet black | 30 | 44.700 | **2046566** |
| **S25W SW** | 25 | 3000 | 1.2 | Jet black | 30 | 70.400 | **2046567** |
| **S32W SW** | 32 | 3000 | 1.2 | Jet black | 21 | 91.200 | **2046568** |
| **S40W SW** | 40 | 3000 | 1.2 | Jet black | 15 | 139.700 | **2046569** |
| **S50W SW** | 50 | 3000 | 1.2 | Jet black | 15 | 176.000 | **2046570** |
| **S63W SW** | 63 | 3000 | 1.2 | Jet black | 9 | 223.000 | **2046571** |

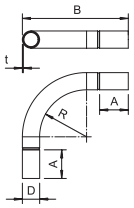
St Steel

PE50 PES50 - Polyester/epoxy

Electrical installation pipe without threaded ends according to EN 61386-1 for mechanical protection of cables. With burr-free inner wall.

## Black powder-coated steel bend, without thread

E30 E90




| Type | Dimension B mm | Dimension D mm | Dimension R mm | Colour | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|
| **SBN16 SW** | 103 | 16.6 | 50 | Jet black | 15 | 7.200 | **2046824** |
| **SBN20 SW** | 155 | 20.6 | 90 | Jet black | 25 | 13.300 | **2046825** |
| **SBN25 SW** | 190 | 25.6 | 110 | Jet black | 25 | 24.400 | **2046826** |
| **SBN32 SW** | 254 | 32.7 | 150 | Jet black | 20 | 41.000 | **2046827** |
| **SBN40 SW** | 279 | 40.7 | 170 | Jet black | 15 | 68.900 | **2046828** |
| **SBN50 SW** | 358 | 51 | 200 | Jet black | 5 | 111.800 | **2046829** |
| **SBN63 SW** | 446 | 64 | 250 | Jet black | 3 | 174.200 | **2046830** |

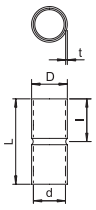
St Steel

PE50 PES50 - Polyester/epoxy

90° bend with moulded sleeves, for electrical installation pipes according to EN 61386-1. With burr-free inner wall.

## Armoured steel pipe connection sleeve without thread, black

E30 E90



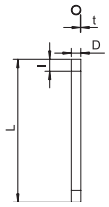

| Type | Dimension D mm | Dimension d mm | Dimension L mm | Dimension l mm | Dimension t mm | Colour | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|---|
| **SV16W SW** | 18.6 | 16.6 | 50 | 25 | 1 | Jet black | 25 | 2.400 | **2046582** |
| **SV20W SW** | 23.1 | 20.7 | 60 | 30 | 1.2 | Jet black | 50 | 3.200 | **2046583** |
| **SV25W SW** | 28.1 | 25.7 | 60 | 30 | 1.2 | Jet black | 50 | 5.200 | **2046584** |
| **SV32W SW** | 35.2 | 32.8 | 70 | 35 | 1.2 | Jet black | 50 | 7.200 | **2046585** |
| **SV40W SW** | 43.8 | 40.8 | 80 | 40 | 1.5 | Jet black | 25 | 13.200 | **2046586** |
| **SV50W SW** | 54 | 51 | 100 | 50 | 1.5 | Jet black | 10 | 20.000 | **2046587** |
| **SV63W SW** | 67 | 64 | 100 | 50 | 1.5 | Jet black | 5 | 28.000 | **2046588** |

St Steel

PE50 PES50 - Polyester/epoxy

Accessory part: plug-in sleeve for the connections between electrical installation pipes. With burr-free inner wall.

## Hot-dip galvanised steel pipe, with thread




5 | 5 | 5 | 7 | 1

M E30 E90

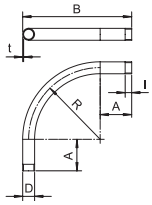
| Type | Thread | Dimension D mm | Dimension L mm | Dimension l mm | Dimension t mm | Pack. m | Weight kg/100 m | Item No. |
|---|---|---|---|---|---|---|---|---|
| **SM16W FT** | M16x1,5 | 16 | 3000 | 13 | 1.3 | 30 | 54.000 | **2046533** |
| **SM20W FT** | M20x1,5 | 20 | 3000 | 13 | 1.5 | 30 | 79.000 | **2046534** |
| **SM25W FT** | M25x1,5 | 25 | 3000 | 18 | 1.5 | 30 | 99.000 | **2046535** |
| **SM32W FT** | M32x1,5 | 32 | 3000 | 18 | 1.5 | 21 | 130.000 | **2046536** |
| **SM40W FT** | M40x1,5 | 40 | 3000 | 20.5 | 1.5 | 15 | 164.000 | **2046537** |
| **SM50W FT** | M50x1,5 | 50 | 3000 | 25 | 1.5 | 15 | 206.000 | **2046538** |
| **SM63W FT** | M63x1,5 | 63 | 3000 | 26 | 1.8 | 9 | 324.700 | **2046540** |

St Steel

FT Hot-dip galvanised

Electrical installation pipe according to EN 61386-1 with threaded ends to EN 60423 for mechanical protection of cables.
With burr-free inner wall. Corrosion protection class 4 (high). One coupling is already screwed onto each pipe.

## Hot-dip galvanised steel bend, with thread




M E30 E90

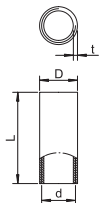
| Type | Thread | Dimension A mm | Dimension B mm | Dimension D mm | Dimension l mm | Dimension R mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|---|---|
| **SBNM16 FT** | M16x1,5 | 45 | 103 | 16 | 13 | 50 | 1.4 | 15 | 10.400 | **2046786** |
| **SBNM20 FT** | M20x1,5 | 55 | 155 | 20 | 13 | 90 | 1.6 | 25 | 21.000 | **2046787** |
| **SBNM25 FT** | M25x1,5 | 68 | 190 | 25 | 18 | 110 | 1.6 | 25 | 33.000 | **2046788** |
| **SBNM32 FT** | M32x1,5 | 88 | 254 | 32 | 18 | 150 | 1.6 | 20 | 56.600 | **2046789** |
| **SBNM40 FT** | M40x1,5 | 89 | 279 | 40 | 20.5 | 170 | 1.6 | 15 | 77.600 | **2046790** |
| **SBNM50 FT** | M50x1,5 | 133 | 358 | 50 | 25 | 200 | 1.6 | 5 | 125.800 | **2046791** |
| **SBNM63 FT** | M63x1,5 | 165 | 446 | 63 | 25 | 250 | 1.8 | 3 | 227.000 | **2046792** |

St Steel

FT Hot-dip galvanised

90° bend for electrical installation pipes according to EN 61386-1 with threaded ends to DIN EN 60423. With burr-free inner wall.
One connection sleeve is already screwed onto each pipe bend.

## Zinc-nickel coated steel sleeve, with thread




M E30 E90

| Type | Thread | Dimension D mm | Dimension d mm | Dimension L mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|
| **SVM16W DN** | M16x1,5 | 18.5 | 16 | 26 | 2 | 25 | 2.100 | **2046553** |
| **SVM20W DN** | M20x1,5 | 22.5 | 20 | 30 | 2 | 50 | 3.400 | **2046554** |
| **SVM25W DN** | M25x1,5 | 27.5 | 25 | 40 | 2 | 50 | 3.986 | **2046556** |
| **SVM32W DN** | M32x1,5 | 35.5 | 32 | 40 | 2.5 | 50 | 8.800 | **2046557** |
| **SVM40W DN** | M40x1,5 | 43.5 | 40 | 45 | 2.5 | 25 | 11.400 | **2046558** |
| **SVM50W DN** | M50x1,5 | 53.5 | 50 | 54 | 2.5 | 10 | 17.000 | **2046559** |
| **SVM63W DN** | M63x1,5 | 68 | 63 | 60 | 3.2 | 5 | 30.700 | **2046560** |

St Steel

DN Zinc / nickel-coated

Accessory part: coupling with thread according to EN 60423 to connect electrical installation pipes and 90° bends.







Always indicate the item number when ordering.

## Hot-dip galvanised steel pipe, without thread

E30 E90

| Type | Dimension D mm | Dimension L mm | Dimension t mm | Pack. m | Weight kg/100 m | Item No. |
|---|---|---|---|---|---|---|
| **S16W FT** | 16 | 3000 | 1 | 30 | 37.000 | **2046593** |
| **S20W FT** | 20 | 3000 | 1 | 30 | 44.700 | **2046594** |
| **S25W FT** | 25 | 3000 | 1.2 | 30 | 70.400 | **2046595** |
| **S32W FT** | 32 | 3000 | 1.2 | 21 | 91.200 | **2046596** |
| **S40W FT** | 40 | 3000 | 1.2 | 15 | 139.700 | **2046597** |
| **S50W FT** | 50 | 3000 | 1.2 | 15 | 176.000 | **2046598** |
| **S63W FT** | 63 | 3000 | 1.2 | 9 | 223.000 | **2046599** |

St Steel

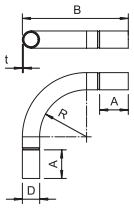
FT Hot-dip galvanised

Electrical installation pipe without threaded ends according to EN 61386-1 for mechanical protection of cables. With burr-free inner wall. Corrosion protection class 4 (high).

4 4 5 7 1

## Hot-dip galvanised steel bend, without thread

E30 E90



| Type | Dimension A mm | Dimension B mm | Dimension D mm | Dimension l mm | Dimension R mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|---|
| **SBN16 FT** | 43.7 | 103 | 16.6 | 25 | 50 | 1 | 15 | 7.200 | **2046816** |
| **SBN20 FT** | 53.7 | 155 | 20.6 | 30 | 90 | 1 | 25 | 13.300 | **2046817** |
| **SBN25 FT** | 66.5 | 190 | 25.6 | 40 | 110 | 1.2 | 25 | 24.400 | **2046818** |
| **SBN32 FT** | 86.5 | 254 | 32.7 | 40 | 150 | 1.2 | 20 | 41.000 | **2046819** |
| **SBN40 FT** | 87.2 | 279 | 40.7 | 50 | 170 | 1.5 | 15 | 68.900 | **2046820** |
| **SBN50 FT** | 131 | 358 | 51 | 60 | 200 | 1.5 | 5 | 111.800 | **2046821** |
| **SBN63 FT** | 163 | 446 | 64 | 90 | 250 | 1.5 | 3 | 174.200 | **2046822** |

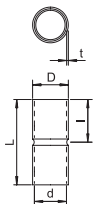
St Steel

FT Hot-dip galvanised

90° bend with moulded sleeves, for electrical installation pipes according to EN 61386-1. With burr-free inner wall.

## Hot-dip galvanised steel sleeve, without thread

E30 E90



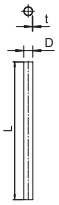
| Type | Dimension D mm | Dimension d mm | Dimension L mm | Dimension l mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|
| **SV16W FT** | 18.6 | 16.6 | 50 | 25 | 1 | 25 | 2.200 | **2046620** |
| **SV20W FT** | 23.1 | 20.7 | 60 | 30 | 1.2 | 50 | 3.200 | **2046621** |
| **SV25W FT** | 28.1 | 25.7 | 60 | 30 | 1.2 | 50 | 5.600 | **2046622** |
| **SV32W FT** | 35.2 | 32.8 | 70 | 35 | 1.2 | 50 | 7.800 | **2046623** |
| **SV40W FT** | 43.8 | 40.8 | 80 | 40 | 1.5 | 25 | 14.400 | **2046624** |
| **SV50W FT** | 54 | 51 | 100 | 50 | 1.5 | 10 | 22.000 | **2046625** |
| **SV63W FT** | 67 | 63 | 100 | 50 | 1.5 | 5 | 28.000 | **2046626** |

St Steel

FT Hot-dip galvanised

Accessory part: plug-in sleeve for the connections between electrical installation pipes. With burr-free inner wall.

## Stainless steel pipe, V2A




5 | 5 | 5 | 7 | 1

E30 E90

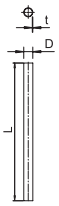
| Type | Dimension D mm | Dimension L mm | Dimension t mm | Pack. m | Weight kg/100 m | Item No. |
|---|---|---|---|---|---|---|
| **S16W A2** | 16 | 3000 | 1 | 30 | 37.000 | **2046720** |
| **S20W A2** | 20 | 3000 | 1 | 30 | 46.900 | **2046721** |
| **S25W A2** | 25 | 3000 | 1 | 30 | 59.200 | **2046722** |
| **S32W A2** | 32 | 3000 | 1.2 | 21 | 91.200 | **2046723** |
| **S40W A2** | 40 | 3000 | 1.2 | 15 | 114.800 | **2046724** |
| **S50W A2** | 50 | 3000 | 1.5 | 15 | 179.400 | **2046725** |
| **S63W A2** | 63 | 3000 | 1.5 | 9 | 227.500 | **2046726** |

V2A Stainless steel, A2

GEB Brushed

Electrical installation pipe without threaded ends to EN 61386-1 for mechanical protection of cables. With burr-free inner wall. Corrosion protection class 4 (high).
Classification according to DIN EN 61386-1: 555711404010

## Stainless steel pipe, V4A




5 | 5 | 5 | 7 | 1

E30 E90

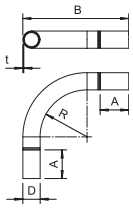
| Type | Dimension D mm | Dimension L mm | Dimension t mm | Pack. m | Weight kg/100 m | Item No. |
|---|---|---|---|---|---|---|
| **S16W A4** | 16 | 3000 | 1 | 15 | 37.000 | **2046750** |
| **S20W A4** | 20 | 3000 | 1 | 15 | 46.900 | **2046751** |
| **S25W A4** | 25 | 3000 | 1 | 15 | 59.200 | **2046752** |
| **S32W A4** | 32 | 3000 | 1.2 | 15 | 91.200 | **2046753** |
| **S40W A4** | 40 | 3000 | 1.2 | 9 | 114.800 | **2046754** |
| **S50W A4** | 50 | 3000 | 1.5 | 9 | 179.400 | **2046755** |
| **S63W A4** | 63 | 3000 | 1.5 | 9 | 227.500 | **2046756** |

V4A Stainless steel, A4

GEB Brushed

Electrical installation pipe without threaded ends to EN 61386-1 for mechanical protection of cables. With burr-free inner wall. Corrosion protection class 4 (high).

## Stainless steel pipe bend, V4A




E30 E90

| Type | Dimension A mm | Dimension B mm | Dimension D mm | Dimension l mm | Dimension R mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|---|
| **SB16W A4** | 54 | 104 | 18.2 | 25 | 50 | 1 | 5 | 7.200 | **2046760** |
| **SB20W A4** | 66 | 156 | 22.2 | 30 | 90 | 1 | 10 | 13.300 | **2046761** |
| **SB25W A4** | 81.5 | 194 | 27.2 | 30 | 112.5 | 1 | 10 | 20.400 | **2046762** |
| **SB32W A4** | 104 | 250 | 34.7 | 35 | 146 | 1.25 | 10 | 42.000 | **2046763** |
| **SB40W A4** | 129 | 294 | 42.7 | 40 | 165 | 1.25 | 5 | 61.200 | **2046764** |
| **SB50W A4** | 158 | 408 | 52.7 | 50 | 250 | 1.25 | 5 | 79.500 | **2046765** |
| **SB63W A4** | 198 | 448 | 65.7 | 50 | 250 | 1.25 | 3 | 144.600 | **2046766** |

V4A Stainless steel, A4

90° bend with moulded sleeves, for electrical installation pipes according to EN 61386-1. With burr-free inner wall.



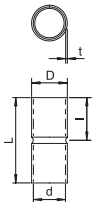




Always indicate the item number when ordering.

## Stainless steel sleeve V4A

E30 E90

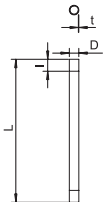



| Type | Dimension D mm | Dimension d mm | Dimension L mm | Dimension l mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|
| **SV16W A4** | 18.2 | 16.2 | 50 | 25 | 1 | 10 | 2.100 | **2046770** |
| **SV20W A4** | 22.2 | 20.2 | 60 | 30 | 1 | 15 | 3.200 | **2046771** |
| **SV25W A4** | 27.2 | 25.2 | 60 | 30 | 1 | 15 | 3.900 | **2046772** |
| **SV32W A4** | 34.7 | 32.2 | 70 | 35 | 1.25 | 15 | 7.300 | **2046773** |
| **SV40W A4** | 42.7 | 40.2 | 80 | 40 | 1.25 | 10 | 10.300 | **2046774** |
| **SV50W A4** | 52.8 | 50.2 | 100 | 50 | 1.3 | 5 | 16.700 | **2046775** |
| **SV63W A4** | 65.8 | 63.2 | 100 | 50 | 1.3 | 3 | 20.900 | **2046776** |

V4A Stainless steel, A4

Accessory part: plug-in sleeve for the connections between electrical installation pipes. With burr-free inner wall.

## Aluminium pipe, with thread




5 | 5 | 5 | 6 | 1

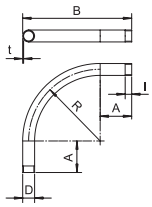
M

| Type | Thread | Dimension D mm | Dimension L mm | Dimension t mm | Pack. m | Weight kg/100 m | Item No. |
|---|---|---|---|---|---|---|---|
| **SM16W ALU** | M16x1,5 | 16 | 3000 | 1.6 | 30 | 19.543 | **2046032** |
| **SM20W ALU** | M20x1,5 | 20 | 3000 | 1.9 | 30 | 29.170 | **2046033** |
| **SM25W ALU** | M25x1,5 | 25 | 3000 | 1.9 | 30 | 37.230 | **2046034** |
| **SM32W ALU** | M32x1,5 | 32 | 3000 | 1.9 | 30 | 48.510 | **2046035** |
| **SM40W ALU** | M40x1,5 | 40 | 3000 | 1.9 | 15 | 61.403 | **2046036** |
| **SM50W ALU** | M50x1,5 | 50 | 3000 | 2.1 | 15 | 85.323 | **2046037** |
| **SM63W ALU** | M63x1,5 | 63 | 3000 | 2.1 | 15 | 108.480 | **2046038** |

Alu Aluminium

Electrical installation pipe to EN 61386-1 with threaded ends to DIN EN 60423 for mechanical protection of cables.
With burr-free inner wall. One connection sleeve is already screwed onto each pipe.

## Aluminium pipe bend, with thread



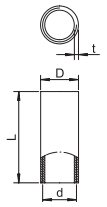

M

| Type | Thread | Dimension A mm | Dimension B mm | Dimension D mm | Dimension l mm | Dimension R mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|---|---|
| **SBM16W ALU** | M16x1,5 | 78 | 150 | 16 | 15 | 64 | 1.6 | 15 | 3.300 | **2046042** |
| **SBM20W ALU** | M20x1,5 | 80 | 170 | 20 | 15 | 80 | 1.9 | 25 | 7.300 | **2046043** |
| **SBM25W ALU** | M25x1,5 | 93 | 208 | 25 | 20 | 102.5 | 1.9 | 25 | 11.500 | **2046044** |
| **SBM32W ALU** | M32x1,5 | 105 | 252 | 32 | 20 | 131 | 1.9 | 20 | 20.000 | **2046045** |
| **SBM40W ALU** | M40x1,5 | 115 | 300 | 40 | 20 | 165 | 1.9 | 15 | 27.300 | **2046046** |
| **SBM50W ALU** | M50x1,5 | 128 | 358 | 50 | 25 | 205 | 2.1 | 5 | 49.500 | **2046047** |
| **SBM63W ALU** | M63x1,5 | 135 | 423 | 63 | 25 | 256.5 | 2.1 | 3 | 78.400 | **2046048** |

Alu Aluminium

90° bend for electrical installation pipes according to EN 61386-1 with threaded ends to DIN EN 60423. With burr-free inner wall.
One connection sleeve is already screwed onto each pipe bend.

## Aluminium sleeve, with thread




M

| Type | Thread | Dimension D mm | Dimension d mm | Dimension L mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|
| **SVM16W ALU** | M16x1,5 | 18.5 | 16 | 35 | 2.25 | 50 | 1.080 | **2046052** |
| **SVM20W ALU** | M20x1,5 | 22.5 | 20 | 35 | 2.25 | 50 | 1.100 | **2046053** |
| **SVM25W ALU** | M25x1,5 | 28 | 25 | 45 | 2.5 | 50 | 2.430 | **2046054** |
| **SVM32W ALU** | M32x1,5 | 35 | 32 | 45 | 2.5 | 50 | 3.100 | **2046055** |
| **SVM40W ALU** | M40x1,5 | 43.5 | 40 | 45 | 2.75 | 20 | 4.270 | **2046056** |
| **SVM50W ALU** | M50x1,5 | 53.5 | 50 | 55 | 2.75 | 20 | 6.510 | **2046057** |
| **SVM63W ALU** | M63x1,5 | 66.5 | 63 | 55 | 2.8 | 20 | 8.320 | **2046058** |

Alu Aluminium

Accessory part: coupling with thread according to EN 60423 to connect electrical installation pipes and 90° bends.







Always indicate the item number when ordering.

## Aluminium pipe, without thread

| Type | Dimension D mm | Dimension L mm | Dimension t mm | Pack. m | Weight kg/100 m | Item No. |
|---|---|---|---|---|---|---|
| **S16W ALU** | 16 | 3000 | 1.2 | 30 | 15.065 | **2046002** |
| **S20W ALU** | 20 | 3000 | 1.2 | 30 | 19.134 | **2046003** |
| **S25W ALU** | 25 | 3000 | 1.3 | 30 | 26.134 | **2046004** |
| **S32W ALU** | 32 | 3000 | 1.3 | 30 | 33.853 | **2046005** |
| **S40W ALU** | 40 | 3000 | 1.4 | 15 | 45.839 | **2046006** |
| **S50W ALU** | 50 | 3000 | 1.4 | 15 | 57.714 | **2046007** |
| **S63W ALU** | 63 | 3000 | 1.7 | 15 | 88.394 | **2046008** |

Alu Aluminium



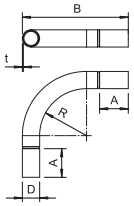

4 | 4 | 5 | 6 | 1

Electrical installation pipe without threaded ends to EN 61386-1 for mechanical protection of cables. With burr-free inner wall.

## Aluminium pipe bend, without thread

| Type | Dimension A mm | Dimension B mm | Dimension D mm | Dimension l mm | Dimension R mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|---|
| **SB16W ALU** | 78 | 151 | 16 | 28 | 64 | 1.2 | 15 | 2.350 | **2046012** |
| **SB20W ALU** | 80 | 171 | 20 | 30 | 80 | 1.2 | 25 | 5.500 | **2046013** |
| **SB25W ALU** | 93 | 209 | 25 | 38 | 102.5 | 1.3 | 25 | 9.000 | **2046014** |
| **SB32W ALU** | 105 | 253 | 32 | 40 | 131 | 1.3 | 20 | 14.100 | **2046015** |
| **SB40W ALU** | 115 | 302 | 40 | 50 | 165 | 1.4 | 15 | 22.400 | **2046016** |
| **SB50W ALU** | 128 | 360 | 50 | 63 | 205 | 1.4 | 5 | 35.400 | **2046017** |
| **SB63W ALU** | 135 | 425 | 63 | 70 | 256.5 | 1.7 | 3 | 59.500 | **2046018** |

Alu Aluminium

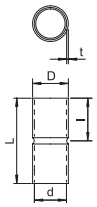



90° bend with moulded sleeves, for electrical installation pipes according to EN 61386-1. With burr-free inner wall.

## Aluminium sleeve, without thread

| Type | Dimension D mm | Dimension d mm | Dimension L mm | Dimension l mm | Dimension t mm | Pack. pcs | Weight kg/100 pcs. | Item No. |
|---|---|---|---|---|---|---|---|---|
| **SV16W ALU** | 18.6 | 16.2 | 40 | 20 | 1.2 | 50 | 0.700 | **2046022** |
| **SV20W ALU** | 22.6 | 20.2 | 50 | 25 | 1.2 | 50 | 1.300 | **2046023** |
| **SV25W ALU** | 27.6 | 25.2 | 60 | 30 | 1.2 | 50 | 1.900 | **2046024** |
| **SV32W ALU** | 34.6 | 32.2 | 70 | 35 | 1.2 | 50 | 2.400 | **2046025** |
| **SV40W ALU** | 43 | 40.2 | 70 | 35 | 1.4 | 20 | 4.000 | **2046026** |
| **SV50W ALU** | 53 | 50.2 | 90 | 45 | 1.4 | 20 | 6.100 | **2046027** |
| **SV63W ALU** | 66.2 | 63.2 | 110 | 55 | 1.5 | 20 | 9.000 | **2046028** |

Alu Aluminium




Accessory part: plug-in sleeve for the connections between electrical installation pipes. With burr-free inner wall.





Always indicate the item number when ordering.

Wilhelm Grillo Handelsgesellschaft mbH, Am Grillopark 5, 47169 Duisburg

Safety Data Sheet according to Regulation No. EC 1907/2006

Zinc

---

Version: 2

Revision date: August 2018 Printing date: 15th August 2018

---

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### *1.1. Product identifier*

| | |
|---|---|
| Substance name: | Zinc massive |
| Chemical formula: | Zn |
| Trade name: | Zinc |
| CAS-Number: | 7440-66-6 |
| Index-No: | 034-001-00-2 |
| EINECS-Number: | 231-175-3 |
| REACH Registration number: | 01-2119467174-37-0024 |

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

**Identified uses**

Manufacturing of various parts and products. Registered uses, for this product, can be found in section 15 of this eSDS.

**Uses advised against**

–

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

Company Name

Wilhelm Grillo Handelsgesellschaft mbH, Am Grillopark 5, 47169 Duisburg, Deutschland/Germany

Tel.: +49 203 40 66 – 0 / Fax: +49 203 40 66 – 114

http://www.grillohandel.de – e-mail: reach@grillohandel.de

### *1.4. Emergency telephone number*

## SECTION 2: HAZARDS IDENTIFICATION

### *2.1. Classification of the substance or mixture*

**Classification according to Regulation (EC) No 1272/2008 as amended**

This substance does not meet the criteria for classification according to Regulation (EC) 1272/2008 as amended.

**Hazard summary** Occupational exposure to the substance or mixture may cause adverse health effects.

### *2.2. Label elements*

**Label according to Regulation (EC) No. 1272/2008 as amended**

| | |
|---|---|
| **Contains:** | Zinc |
| **Hazard pictograms** | None |
| **Signal word** | None |
| **Hazard statements** | The substance does not meet the criteria for classification. |

| | |
|---|---|
| **Precautionary statements** | |
| **Prevention** | Observe good industrial hygiene practices. |
| **Response** | Wash thoroughly after handling. |
| **Storage** | Store away from incompatible materials. |
| **Disposal** | Dispose of waste and residues in accordance with local authority requirements. |
| **Supplemental label information** | None |

### *2.3. Other hazards*

This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### *3.1. Substances*

**General information**

| Chemical name | % | CAS-No./ EC-No. | REACH-Registration-No. | Index-No. | Notes |
|---|---|---|---|---|---|
| Zinc | ≥98,5 | 7440-66-6<br>231-175-3 | 01-2119467174-37-0024 | – | |

**Classification:** –

**Composition comments** This product is registered under the REACH Regulation 1907/2006 as a mono-constituent substance. All concentrations are in percent by weight. For more detailed chemical composition, refer to the certificate of analysis.

## SECTION 4: FIRST AID MEASURES

### *4.1. Description of first aid measures*

**General information**

Get medical attention if any discomfort develops. Seek medical attention for all burns, regardless how minor they may seem.
Show this safety data sheet to the doctor in attendance.

**Inhalation**

In case of exposure to fumes or particulates: Move to fresh air. Get medical attention if discomfort persists.

**Skin contact**

Contact with dust: Wash with soap and water. Get medical attention if irritation develops or persists. In case of contact with molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

**Eye contact**

Do not rub eyes. Remove any contact lenses. Flush eyes thoroughly with water, taking care to rinse under eyelids. If irritation persists, continue flushing for 15 minutes, rinsing from time to time under eyelids. If discomfort continues, consult a physician.

**Ingestion**

Rinse mouth thoroughly if dust is ingested. Do not induce vomiting. Get medical attention if any discomfort continues.

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

Irritation of eyes and mucous membranes. Irritation of nose and throat. Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain.

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

Treat symptomatically.

## SECTION 5: FIREFIGHTING MEASURES

**General fire hazards**

Solid metal is not flammable.

### 5.1. *Extinguishing media*

**Suitable extinguishing media**

Special powder against metal fires. Dry sand.

**Unsuitable extinguishing media**

Do not use water or halogenated extinguishing media.

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

Fire or high temperatures create: Metal oxides.

### 5.3. *Advice for fire fighters*

**Special protective equipment for fire fighters**

Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**Special fire fighting procedures**

Move container from fire area if it can be done without risk.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

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

**For non-emergency personnel**

Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes.

Wear protective clothing as described in section 8 of this safety data sheet.

**For emergency responders**

Wear protective clothing as described in Section 8 of this safety data sheet.

### 6.2. *Environmental precautions*

Avoid release to the environment.

### 6.3. *Methods and materials for containment and clearing up*

Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal.

Collect dust or particulates using a vacuum cleaner with a HEPA filter.

### 6.4. *References to other sections*

For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for safe handling

Avoid generation and spreading of dust. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts. Provide adequate ventilation. Use appropriate tools. Avoid contact with sharp edges and hot surfaces. Avoid inhalation of dust and contact with skin and eyes. Avoid contact with molten material. Do not use water on molten metal. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

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

Keep dry. Store away from incompatible materials.

### 7.3. Specific end uses(s)

For detailed information, see section 15. Observe industrial sector guidance on best practices.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control parameters

**Occupational exposure limits**

No exposure limits noted for ingredient(s).

**Biological limit values**

No biological exposure limits noted for the ingredient(s).

**Recommended monitoring procedures**

Follow standard monitoring procedures.

**Derived no effect levels (DNELs)**

**General Population**

| Product | Value | Assessment factor | Notes |
|---|---|---|---|
| Zinc (CAS 7440-66-6) | | | |
| Long-term, Systemic, Dermal | 83 mg/kg bw/day | | Repeated dose toxicity |
| Long-term, Systemic, Inhalation | 2.5 mg/m3 | | Repeated dose toxicity |
| Long-term, Systemic, Oral | 0.83 mg/kg bw/day | | Repeated dose toxicity |

**Workers**

| Product | Value | Assessment factor | Notes |
|---|---|---|---|
| Zinc (CAS 7440-66-6) | | | |
| Long-term, Systemic, Dermal | 83 mg/kg bw/day | | Repeated dose toxicity |
| Long-term, Systemic, Inhalation | 5 mg/m3 | | Repeated dose toxicity |

**Predicted no effect concentrations (PNECs)**

| Product | Value | Assessment factor | Notes |
|---|---|---|---|
| Zinc (CAS 7440-66-6) | | | |
| Freshwater | 20.6 µg/l | | |
| Marine water | 6.1 µg/l | | |
| Sediment (freshwater) | 117.8 mg/kg | | |
| Sediment (marine water) | 56.5 mg/kg | | |
| Soil | 35.6 mg/kg | | |
| STP | 100 µg/l | | |

## *8.2. Exposure controls*

**Appropriate engineering controls**

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. If no exposure limits are stated, follow the recommended exposure limit of 10 mg/m3 for total nuisance dust. Use explosion-proof equipment if high dust/air concentrations are possible.

**Individual protection measures, such as personal protective equipment**

**General information**

Use personal protective equipment as required. Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

**Eye/face protection**

Wear dust-resistant safety goggles where there is danger of eye contact. In addition to safety glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles, during sawing, grinding, or machining.

**Skin protection**

**– Hand protection**

Wear suitable protective gloves to prevent cuts and abrasions. E.g. type of ¾ dipped natural latex, with steel, fiberglass and Kevlar liner and long knitted cuff, cut protection level 5. When material is heated, wear gloves to protect against thermal burns. Suitable gloves can be recommended by the glove supplier.

**– Other**

Wear suitable protective clothing. Regular protective clothing with high visibility according to EN471 Class 2 is recommended.

**Respiratory protection**

In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter (type P2).
Check with respiratory protective equipment suppliers.

**Thermal hazards**

Wear appropriate thermal protective clothing, when necessary.

**Hygiene measures**

Wash hands after handling. Routinely wash work clothing and protective equipment to remove contaminants.
Handle in accordance with good industrial hygiene and safety practices. Follow up on any medical surveillance requirements.

**Environmental exposure controls**

Contain spills and prevent releases and observe national regulations on emissions. Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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

**Appearance**

| | |
|---|---|
| Physical state | Solid |

| | |
|---|---|
| Form | Massive, solid metal<br>Solid forms such as: Ingots, T-bars, Jumbosand Strips |
| Colour | Silver-grey |
| Odour | Odourless |
| Odour threshold | Not applicable |
| pH | Not applicable |
| Melting point/freezing point | 419.53 °C (787.15 °F) |
| Initial boiling point and boiling range | Not applicable |
| Flash point | Not applicable |
| Evaporation rate | Not applicable |
| Flammability (solid, gas) | Non flammable |
| **Upper/lower flammability or explosive limits** | |
| Flammability limit - lower (%) | Not applicable |
| Flammability limit - upper (%) | Not applicable |
| Vapour pressure | Not applicable |
| Vapour density | Not applicable |
| Relative density | 7.14 (25°C / 77°F) |
| Solubility(ies) | Insoluble |
| Partition coefficient (n-octanol/water) | Not applicable |
| Auto-ignition temperature | Not applicable |
| Decomposition temperature | Not applicable |
| Viscosity | Not applicable |
| Viscosity temperature | Not applicable |
| Explosive properties | Not explosive |
| Oxidising properties | Not oxidizing |

### *9.2. Other information*

| | |
|---|---|
| Dynamic viscosity | > 500 mPa.s (417 °C (782.6 °F)) |

## SECTION 10: STABILITY AND REACTIVITY

### *10.1. Reactivity*

Massive metal is non reactive under normal conditions of use, storage and transport.

### *10.2. Chemical stability*

Massive metal is stable under normal conditions of use, storage and transport.

### *10.3. Possibility of hazardous reactions*

Hazardous polymerisation does not occur. Contact with acids will release flammable hydrogen gas.

### *10.4. Conditions to avoid*

Contact with acids. Contact with incompatible materials. Keep away from heat, sparks and open flame.

### *10.5. Incompatible materials*

Strong oxidising agents. Mineral acid.

### *10.6. Hazardous decomposition products*

Fire or high temperatures create:
Zinc oxides. Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and fumes of metal oxides.

## SECTION 11: TOXICOLOGICAL INFORMATION

**General information**

Occupational exposure to the substance or mixture may cause adverse effects.

**Information on likely routes of exposure**

| | |
|---|---|
| **Inhalation** | Dust may irritate respiratory system. |
| **Skin contact** | Dust may irritate skin. |
| **Eye contact** | Dust may irritate the eyes. |
| **Ingestion** | Ingestion may cause irritation and malaise. |
| **Symptoms** | May cause irritation of nose, throat and mucous membranes. Flu-like symptoms. |

### *11.1. Information on toxicological effects*

**Acute toxicity**

Inhalation of powder or fumes may cause metal fume fever.

| Product | Species | Test Results |
|---|---|---|
| Zinc (CAS 7440-66-6) | | |
| **Acute** | | |
| **Dust** | | |
| LC50 | Rat | > 5410 mg/m3, 4 Hours |

**Skin corrosion/irritation**

May cause irritation through mechanical abrasion.

**Serious eye damage/eye irritation**

May cause irritation through mechanical abrasion.

**Respiratory sensitisation**

Based on available data, the classification criteria are not met.

**Skin sensitisation**

Based on available data, the classification criteria are not met.

**Germ cell mutagenicity**

Based on available data, the classification criteria are not met.

**Carcinogenicity**

Based on available data, the classification criteria are not met.

**Reproductive toxicity**

Based on available data, the classification criteria are not met.

**Specific target organ toxicity - single exposure**

Based on available data, the classification criteria are not met.

**Specific target organ toxicity - repeated exposure**

Based on available data, the classification criteria are not met.

**Aspiration hazard**

Not classified.

**Mixture versus substance information**

The product is a substance.

**Other information**

Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet radiation.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

Zinc in massive forms presents a limited hazard for the environment.

| Product | | Species | Test Results |
|---|---|---|---|
| Zinc (CAS 7440-66-6) | | | |
| Aquatic - Fish | LC50 | Rainbow trout,donaldson trout (Oncorhynchus mykiss) | 0.41 mg/l, 96 hours |

### 12.2. Persistence and degradability

The product is not biodegradable.

### 12.3. Bioaccumulative potential

The product is not bioaccumulating.

**Partition coefficient n-octanol/water (log Kow)** Not applicable.

**Bioconcentration factor (BCF)** Not available.

### 12.4. Mobility in soil

Zinc in massive forms is not mobile in the environment.

**Mobility in general**

The product is not volatile but may be spread by dust-raising handling

### 12.5. Results of PBT and vPvB assessment

This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII.

### 12.6. Other adverse effects

No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Residual waste**

Recover and recycle, if practical. Solid metal and alloys in the form of particles may be reactive. Its hazardous characteristics, including fire and explosion, should be determined prior to disposal.

**Contaminated packaging**

Dispose of in accordance with local regulations.

**EU waste code**

12 01 99 The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.

**Disposal methods/information**

Dispose in accordance with all applicable regulations.

## SECTION 14: TRANSPORT INFORMATION

### 14.1. – 14.6.

**ADR / RID / ADN / IATA / IMDG**

Not regulated as dangerous goods.

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

Not applicable. This product is a solid. Therefore, bulk transport is governed by IMSBC code. The material is not covered under Appendix I.

## SECTION 15: REGULATORY INFORMATION

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

**EU regulations**

**Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I, as amended:** Not listed.

**Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex II, as amended:** Not listed.

**Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I as amended:** Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended**
Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended**
Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended**
Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended**
Not listed.

**Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended:** Zinc (CAS 7440-66-6).

**Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA:** Not listed.

**Authorisations**

**Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended:** Not listed.

**Restrictions on use**

**Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended**
Not listed.

**Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended:** Not listed.

**Other EU regulations**

**Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended:** Not listed.

**Other regulations**

This substance does not meet the criteria for classification according to Regulation (EC) 1272/2008 as amended. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006 as amended.

**National regulations**

Follow national regulation for work with chemical agents in accordance with Directive 98/24/EC, as amended.

## *15.2. Chemical Safety Assessment*

Chemical Safety Assessment has been carried out.

**Identified Uses:**

Uses by workers in industrial settings
Zinc metal production RLE.
Zinc metal production ISF.
Storage of ingots-slabs in warehouses.
Production of chemicals (pyrotechnical process).
Production of chemicals (hydrotechnical process).
Additive for production of inorganic catalysts.
Melting, alloying and casting.
Cathodic protection - sacrifical anodes,
Downstream use of zinc-based sacrifical anodes.
Extraction of PM (Parkes process).
Zinc casting / granules, pellets, prills, L
Zinc sheet casting and rolling.
Wire and rods manufacturing.
Downstream use of Zn based wire for metal spraying.
Component for soldering/brazing/welding products.
Downstream use of Zinc based brazing/soldering products.
Strips and coins manufacturing.
Batteries ballots, cans manufacturing.
Zinc (pure or alloyed) powder manufacturing.
Passivated zinc powder manufacturing (pure or alloyed).
Use of active powders for batteries.
Use of Zinc powders, pure or slightly alloyed, for formulation of paints, coatings, and inks.
Use of zinc powder for mechanical plating.
Use of zinc powder based paints, coatings and inks.
Use of zinc powder as reductant reagent.
Use of (alloyed) Zn powder as corrosion inhibitor for lubricants.
Use of zinc powder (pure or alloyed) in the manufacture of diamond tools.
Use of zinc powder (pure or alloyed) in the manufacture of friction lining.
Use of zinc powder (pure or alloyed) in the manufacture of carbon brushes

## SECTION 16: OTHER INFORMATION

**List of abbreviations**

PBT: Persistent, bioaccumulative and toxic.
vPvB: Very Persistent and very Bioaccumulative.

**References**

IUCLID
IARC: Chemical safety report.
ECHA registered substances database

**Information on evaluation method leading to the classification of mixture**
Not applicable.

**Full text of any H-statements not written out in full under Sections 2 to 15**
None.

**Revision information:**
Version 2
In all sections.

Wilhelm Grillo Handelsgesellschaft mbH, Am Grillopark 5, 47169 Duisburg

Safety Data Sheet according to Regulation No. EC 1907/2006

Remelted Zinc

---

Version: 1

Revision date: July 2020 Printing date: 24th July 2020

---

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

### *1.1. Identification of the substance or preparation*

| | |
|---|---|
| Product name: | Remelted zinc (ZS1, ZS2, ZSA according to prEN13283) |
| Chemical name: | not applicable |
| Formula: | not applicable |
| CAS number: | 7440-66-6 |
| Product code: - | |
| Use of the substance/preparation: | Industrial applications |
| REACH registration number: | 01-2119467174-37-XXXX |

### *1.2. Relevant uses and uses advised against*

- Corrosion inhibitors and anti-scaling agents
- Plating agents and metal surface treating agents
- Laboratory chemicals
- Reducing agents
- Alloying element / castings / sheets / coils / anodic protection / battery component

A complete list of uses for which a Generic Exposure Scenario (GES) is provided in the annex introduction.

➔ no uses advised against

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

Company Name
Wilhelm Grillo Handelsgesellschaft mbH, Am Grillopark 5, 47169 Duisburg, Deutschland/Germany
Tel.: +49 203 40 66 – 0 / Fax: +49 203 40 66 – 114
http://www.grillohandel.de – e-mail: reach@grillohandel.de

### *1.4. Emergency telephone number*

## SECTION 2: HAZARDS IDENTIFICATION

### *2.1. Classification of the substance or mixture*

**Classification according to Regulation (EC) No 1272/2008 as amended**

Not classified as dangerous according to the criteria of Regulation (EC) No 1272/2008.

### *2.2. Label elements*

Not classified as dangerous according to the criteria of Regulation (EC) No 1272/2008.

## 2.3. Other hazards

During treatment and at high temperatures, zinc or zinc oxide furmes may arise. Inhalation of these fumes may cause zinc fever, with symptoms of "influenza". Inhalation of zinc dust may cause gastro-intestinal disorder. Zinc fumes may cause local eye irritation.
An excessive exposure (inhalation and/or ingestion) to fumes or dust containng lead may lead to : reduced appetiten anaemia, insomnia, headache, excitedness, myalgy and athralgy, muscle weakening, gastritis and liver affections.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substances

Description : zinc metal in different forms

**Constituents**

| Constituent | Typical concentration | Concentration range | Remarks | Classification according to CLP |
|---|---|---|---|---|
| Zinc<br>CAS: 7440-66-6<br>EC no. : 231-175-3 | <= 99.995 % (w/w) | > 98 - <= 99.995 % (w/w) | Covers secondary and primary SHG zinc | Not classified |

**Impurities**

| Impurity | Typical concentration | Concentration range | Remarks |
|---|---|---|---|
| Lead<br><br>EC no. : 231-100-4 | <= 30.0 ppm | | Lead can be as high as 1.5 %<br>For secondary zinc grades |

**Typical composition**

| Components | Weight % |
|---|---|
| Pb | < 1.5 % |
| Cd | < 0.05 % |
| Fe | < 0.12 % |
| Al | < 0.1 % |
| Cu | < 0.1 % |
| Sn | < 0.7 % |

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of first aid measures

**Inhalation**

In case of inhalation of dust or fume, terminate exposure immediately and move to fresh air. Contact a physician.

**Ingestion**

Upon ingestion of dust, contact a physician.

**Skin**

Wash the skin with soap and water. Get medical attention if irritation develops.

**Eyes**

Rinse eyes with large amounts of water, including eyelids. Get medical attention if irritation develops:

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

Irritation of eyes and mucous membranes. Irritation of nose and throat. Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain.

## SECTION 5: FIREFIGHTING MEASURES

| | |
|---|---|
| **Suitable extinguishing media:** | dry sand, CO2 |
| **Extinguishing media not to be used:** | no specific measures |
| **Special exposure hazards:** | see heading 11 |
| **Special protective equipment for fire-fighters:** | fire-fighters should wear proper protective clothing and self-contained breathing apparatus |

## SECTION 6: ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| **Personal precautions:** | Avoid creating dust. Wear approved respirators (type P2 or P3) when exposed to dust or fume |
| **Environmental precautions:** | prevent the material from spilling to the surface waters |
| **Methods for cleaning up:** | collect spilled product for reuse, preferably by vacuuming. Avoid dusting |

## SECTION 7: HANDLING AND STORAGE

**Handling**

Avoid contact with skin. Avoid generating dust or fumes. Avoid breathing fumes or dust.
Wear approved respirators if adequate ventilation is not possible.

**Storage**

Zinc ingots may contain voids that could be a site of water accumulation and/or precipitation.
If ingots are remelted with such accumulation, a potentially hazardeous situation could exist.
Storage to avoid such accumulation should be utilized.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OELs for ZnCl2 – group: soluble zinc compounds

(e.g.: $ZnCl_2$ – $ZnSO_4$ - $Zn(H_3PO4)_2$ – $ZnCl_2/2NH_4Cl$ – $ZnCl_2/3NH_4$ Cl)

| Country/organisation | 8 hour-TWA mg/m³ | 15 min-STEL mg/m³ | References |
|---|---|---|---|
| USA | 1 | 2 | ACGIH (1991) |
| The Netherlands | 1 | | SZW (1997) |
| UK | 1 | 2 a) | HSE (1998) |
| Sweden | 1b | | National Board of Occupational Safety and Health, Sweden (1993) |
| Denmark | 0.5 | | Arbejdstilsynet, 1992 |

a) This value is a 10 minutes-STEL

b) This TWA is determined for dust

OELs for ZnO – group: "slightly soluble / insoluble Zn compounds"

(e.g.: ZnO - $Zn(OH)_2$ – $Zn_3(PO4)_2$ – $ZnCO_3$ - Zn metal – ZnS)

| Country/organisation | 8 hour-TWA mg/m³ | 15 min-STEL mg/m³ | References |
|---|---|---|---|
| USA | 5 (fumes) | 10 (fumes) | ACGIH (1991) (guidance values) |
| USA | 5 (fumes)<br>15 (dust; total)<br>5 (dust; respirable) | | OSHA (1989) (legal limit values) |
| The Netherlands / Belgium | 5 (fumes) | | SZW (1997) / ARAB 1999 |
| Germany | 5 (fumes)<br>6 (dust) | | DFG (1997) |
| UK | 5 (fumes)<br>10 (dust) | | HSE (1998) |
| Sweden | 5 (fumes) | | National Board of Occupational Safety and Health, Sweden (1993) |
| Denmark | 4 (fumes)<br>10 (dust) | | Arbejdstilsynet, 1992 |

OEL for Pb lead, inorganis compounds , fumes and dust

| | | | |
|---|---|---|---|
| Belgium | 0,15 mg/m³ | | ARAB 1999 |

## *8.1. DNELs and PNECs*

DNELs

- **Oral**
  - o $DNEL_{oral\ soluble\ Zn}$ = 50 mg Zn/day (i.e., 0.83 mg Zn/kg bw/day);
  - o $DNEL_{oral\ insoluble\ Zn}$ = 50 mg Zn/day (i.e., 0.83 mg Zn/kg bw/day);
- **Dermal**
  - o $DNEL_{dermal\ soluble\ Zn}$ = 500 mg Zn/day (i.e., 8.3 mg Zn/kg bw/day);
  - o $DNEL_{dermal\ insoluble\ Zn}$ = 5000 mg Zn/day (i.e., 83 mg Zn/kg bw/day);
- **Inhalation – Worker**
  - **o** $DNEL_{inhal\ soluble\ Zn\ (worker)}$ = 1 mg $Zn/m_3$;
  - o $DNEL_{inhal\ insoluble\ Zn\ (worker)}$ = 5 mg $Zn/m_3$;
- **Inhalation – Consumer**
  - **o** $DNEL_{inhal\ soluble\ Zn\ (consumer)}$ = 1.3 mg $Zn/m_3$;
  - **o** $DNEL_{inhal\ insoluble\ Zn\ (consumer)}$ = 2.5 mg $Zn/m_3$;

PNECs derived for the zinc ion

| Compartment (Environment) | PNEC value for Zn ion |
|---|---|
| Freshwater | 20.6* µg/L |
| Saltwater | 6.1* µg/L |
| STP | 52 µg/L |
| Freshwater sediment | 117.8* mg/kg sediment d.w.<br>A generic bioavailability factor of 0.5 is applied by default: $PNEC_{bioav}$: 235.6 mg/kg sediment d.w. |
| Saltwater sediment | 56.5* mg/kg sediment d.w.<br>A generic bioavailability factor of 0.5 is applied by default: $PNEC_{bioav:}$ 113 mg/kg sediment d.w. |
| Soil | 35.6* mg/kg soil d.w.<br>A generic bioavailability/ageing factor of 3 is applied by default: $PNEC_{bioav}$: 106.8 mg/kg soil d.w. |
| Oral | No potential for bioaccumulation |

*added value

Calculation of local exposure- Bioavailability correction

The local exposure at a given site can be calculated specifically using the excel sheet prepared by Arche (see "DU scaling tool" on the "tools" page on http://www.reach-zinc.eu/)
In addition, bioavailability corrections can be integrated in the exposure assessment, if the environmental parameters that are needed for the calculations, are documented.

- For water assessment, bioavailability model correction can be applied when the following water parameters are documented for the receiving water: Dissolved organic carbon (DOC), pH, hardness or Ca-concentration. For the calculations, the "zinc BLM-calculator" excel tool is used to this end (see "tools" on http://www.reach-zinc.eu/). When the local values of these parameters are unknown, regional data can be used as an alternative. Use of regional instead of local values should always be handled with caution.
- For sediment, a generic bioavailability factor of 2 is already integrated in the PNEC, based on AVS/SEM levels and according to the risk assessment (ECB 2008). A further refinement of local bioavailability can be made when local AVS/SEM concentrations are documented. The bioavailable fraction of zinc is given by subtracting local AVS from local SEM-Zn (SEM-Zn - AVS).
- For soil, a worst case bioavailability correction (corresponding to sandy soils) is already integrated. Further refinement for zinc bioavailability in other soil types is possible, when the local soil type is documented, together with pH, CEC (see "tools" on http://www.reach-zinc.eu/)

## *8.2. Exposure controls*

### *8.2.1 Appropriate engineering controls*

Technical conditions and measures at process level (source) to prevent release

- Process enclosures or semi-enclosures where appropriate.
- Local exhaust ventilation on furnaces and other work areas with potential dust generation, dust capturing and removal techniques
- Containment of liquid volumes in sumps to collect/prevent accidental spillage

Technical conditions and measures to control dispersion from source towards the worker

- Local exhaust ventilation system (high efficiency 90-95%)
- Cyclones/filters (for minimizing dust emissions) : efficiency: 70-90% (cyclones), 50-80% (dust filters), 85-95% (double stage, cassette filters)
- Process enclosure, especially in potentially dusty units
- Dust control: dust and Zn in dust needs to be measured in the workplace air (static or individual) according to national regulations.
- Special care for the general establishment and maintenance of a clean working environment by e.g.:
  - Cleaning of process equipment and workshop
  - Storage of packaged Zn finished product in dedicated zones

Organisational measures to prevent /limit releases, dispersion and exposure

In general integrated management systems are implemented at the workplace e.g. ISO 9000, ISO 14000 are IPPC-compliant.

Such management system would include general industrial hygiene practice e.g.:

- information and training of personnel on prevention of exposure/accidents,
- procedures for control of personal exposure (hygiene measures)
- regular cleaning of equipment and floors, extended workers instruction-manuals
- Procedures for process control and maintenance...
- personal protection measures (see below)

### *8.2.2 Personal protection*

- Wearing of gloves and protective clothing is compulsory (efficiency >=90%).
- With normal handling, no respiratory personal protection (breathing apparatus) is necessary.
  If risk for exceedance of OEL/DNEL, use e.g.:
  - Dust filter-half mask P1 (efficiency 75%)
  - Dust filter-half mask P2 (efficiency 90%)
  - Dust filter-half mask P3 (efficiency 95%)
  - Dust filter-full mask P1 (efficiency 75%)
  - Dust filter-full mask P2 (efficiency 90 %)
  - Dust filter-full mask P3 (efficiency 97.5%)
- Eyes: safety glasses are optional
- Skin protection :
  Wear protective clothing. Remove contaminated clothing before leaving work areas.
- Personal hygiene :
  Practice good housekeeping and personal hygiene procedures. Do not eat, drink or smoke in the work areas. Wash hands thoroughly before eating, drinking or smoking. Avoid inhalation and ingestion of smoke or fumes, avoid contact with skin and eyes. Don't take contaminated clothing home.
- Information-training of the workers and their staff and line managers focused on careful hygiene behaviour.

### *8.2.3 Environmental exposure control*

Technical conditions and measures at process level (source) to prevent release

- Process enclosures and closed circuits where relevant
- Careful use of sulphuric acid and corrosive solutions, if used
- When applicable, sump containment is provided under the tanks and the filters i.o. to collect any accidental spillage and process waters need to be specifically treated before release
- Dusty operations occur under a specific local ventilation hood
- Process air is filtered before release outside the building

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

- On-site waste water treatment techniques are (if applicable) e.g.:
  chemical precipitation, sedimentation, filtration (efficiency 90-99.98%).
- Containment of liquid volumes in sumps to collect/prevent accidental spillage
- Air emissions are controlled by use of bag-house filters and/or other air emission abatement devices e.g.
  fabric (or bag) filters (up to 99% efficiency), wet scrubbers (50-99% efficiency). This may create a general negative pressure in the building. Air emissions are continuously monitored.

Organizational measures to prevent/limit release from site

- In general emissions are controlled and prevented by implementing an integrated management system e.g.
  ISO 9000, ISO 1400X series, or alike, and, when applicable, by being IPPC-compliant.
  - Such management system should include general industrial hygiene practice e.g.:
    - information and training of workers,
    - regular cleaning of equipment and floors,
    - procedures for process control and maintenance...
- Treatment and monitoring of releases to outside air, and exhaust gas streams (process & hygiene), according to national regulation.
- SEVESO 2 compliance.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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

Overview of physico-chemical properties (from CSR).

| Property | Results |
|---|---|
| a) Appearance at 20°C and 1013 hPa | The physical state of the substance is either<br>1) solid massive metal, its colour is shiny silver |
| 2) odour | odourless |
| 3) odour threshold | Not applicable |
| 4) pH | Not applicable |
| 5) Melting / freezing point | In air zinc powder starts melting at 409°C;<br>In air, cast zinc particles start melting 416°C; |
| 6) Boiling point | Not applicable to solids with melting point >300°C (Column 2 of Annex VII of REACH regulation) |
| 7) Flash point | Not applicable to inorganic substances (Column 2 of Annex VII of REACH regulation) |

| | |
|---|---|
| 8) Evaporation rate | Not applicable to solids |
| 9) Flammability | All grades of zinc powder were not to be considered as flammable. |
| 10) Upper/lower flammability or explosive limits | Not applicable - To be checked and specified if needed |
| 11) Vapour pressure | Not applicable if the melting point is above 300°C (Column 2 of Annex VII REACH regulation) |
| 12) Vapour density | Not applicable |
| 13) Relative density | The density of the substance is 6.9 g/cm$^3$ in powder form, 7.1 g/cm$^3$ in particulate form. |
| 14) Water solubility | The solubility of Zn powder was 0.1 mg/l. Zinc in massive form has very limited solubility |
| 15) Partition coefficient: n-octanol-water | Not applicable to metals; not applicable if the substance is inorganic (column 2 of Annex VII of the REACH regulation) |
| 16) Auto-ignition temperature | The substance is not auto-flammable |
| 17) Decomposition temperature | Not applicable |
| 18) Viscosity | Viscosity of the substance was determined on molten liquid substance. The results show that the viscosity of liquid metal zinc is increasing slowly as a function of decreasing temperature (between 417 -521°C) until the melting point is reached. Here, the melting point seems to be at 417.4 °C. At the melting point, the rapid increase of the viscosity ended the measurement automatically. |
| 19) Explosive properties | In general, based on the TG/DSC measurements and mineral composition, zinc has no flammability, explosive or self-flammability properties. However, hydrogen gas is formed in reaction with water, and thereby zinc has in certain powder forms also flammability and explosive properties. (Outotec 2010) This is reflected by the specific classification of "zinc powder, stabilised" and "zinc powder, pyrophoric". |
| 20) Explosive properties | In general, based on the TG/DSC measurments and mineral composition, zinc has no flammability, explosive or self-flammability properties. However, hydrogen gas id formed in reaction with water, and thereby zinc has in certain powder forms also flammability and explosive properties (Outotec 2010). This is reflected by the specific classification of “zinc powder, stabilised” and “zinc powder, pyrophoric”. |
| Granulometry | The D50 of the tested zinc powder is 71 µm, the D80 is 148 µm |

## SECTION 10: STABILITY AND REACTIVITY

The product is stable in normal circumstances.

**Conditions to avoid**

Contact with water or incompatible materials.

**Materials to avoid**

Acids, oxidizing agents.

**Hazardous decomposition products**

Upon heating, a toxic fume of lead and zinc compounds may occur.

## SECTION 11: TOXICOLOGICAL INFORMATION

**Acute toxicity**

Inhalation

Pb: an excessive exposure (inhalation/ingestion) to fumes or dust containing lead may lead to : reduced appetite, anaemia, nausea, insomnia, headache, excitedness, myalgy and athralgy, muscle weakening, gastritis and liver affections.

Zn:

| Product/ingredient name | Result | Species | Dose | Exposure | Refs |
|---|---|---|---|---|---|
| Zinc powder | LC50 Inhalation Dusts and mists | Rat | >5.4 mg/L | 4 hours | Arts (1996) |
| Zinc powder | LD50 Oral | Rat | >2000 mg/kg | NA | Prinsen (1996) |

With $LD_{50}$ values consistently exceeding 2,000 mg/kg bw, slightly soluble compounds such as, zinc (LD50 >2,000mg/kg bw) show low level of acute oral toxicity, not leading to classification for acute oral toxicity
Zinc metal is shown to be of low acute inhalation toxicity (i.e., LC50 values of > 5.41 mg/L/4hrs), not leading to classification for acute inhalation toxicity

Skin
No skin irritation or sensitivity was reported.
Eyes
Zinc fumes may cause local eye irritation.

**Irritation/Corrosion**

Skin: not irritant (based on cross-reading from slightly soluble Zn compound, Zinc oxide, (Löser, 1977; Lansdown, 1991))
Eye: not irritant (Van Huygevoort, 1999 c, d)
Respiratory tract: not irritant (based on cross-reading from slightly soluble Zn compound, Zinc oxide, (Klimish et al, 1982)

**Sensitization**

No sensitizing effects known (based on cross-reading from slightly soluble Zn compound, Zinc oxide (Van Huygevoort, 1999 g, h)

**Germ cell mutagenicity**

No biologically relevant genotoxic activity (based on cross-reading between Zn compounds; no classification for mutagenicity required) (Chemical Safety report (CSR) zinc. 2010)

**Carcinogenicity**

No experimental or epidemiological evidence exists to justify classification of zinc compounds for carcinogenic activity (based on cross-reading between Zn compounds; no classification for carcinogenicity required) (Chemical Safety report (CSR) zinc. 2010)

**Reproductive toxicity**
No experimental or epidemiological evidence exists to justify classification of zinc compounds for reproductive or developmental toxicity (based on cross-reading between Zn compounds; no classification for reproductive toxicity required) (Chemical Safety report (CSR) zinc. 2010)

**Specific target organ toxicity (single exposure)**
No experimental or epidemiological sufficient evidence for specific target organ toxicity (single exposure) (based on cross-reading from ZnO; no classification for target organ toxicity (single exposure: STOT-SE) required) (Heydon and Kagan, 1990; Gordon et al., 1992; Mueller and Seger, 1985 [Cited in Chemical Safety report (CSR) zinc. 2010)]).

**Specific target organ toxicity (repeated exposure)**
Zn:
No experimental or epidemiological sufficient evidence for specific target organ toxicity (repeated exposure) (based on cross-reading from ZnO; no classification for specific target organ toxicity (repeated exposure: STOT-RE) required) (Lam et al, 1985, 1988; Conner et al., 1988 [Cited in Chemical Safety report (CSR) zinc. 2010)]).

Pb:
Long term inhalation of lead containing dust or fume may weaken and/or damage the nerve system and the immunosystem, as well as an increase of systolic blood prssure and risk of kidney damage.
Zn is relatively non-toxic and chronic effects were not reported.

**Aspiration hazard**
Not available

**Irritation/sensitization**
Sensitivity of the skin was not reported. Zinc fumes are irritating for the eyes.

## SECTION 12: ECOLOGICAL INFORMATION

### *12.1. Toxicity*

#### *12.1.1 Acute aquatic toxicity*

The Acute aquatic toxicity database on zinc contains data on 11 standard species obtained under standard testing conditions at different pH and hardness. Since the transformation/dissolution of zinc metal is dependent on pH, the available acute aquatic toxicity dataset has also been considered for 2 different pH ranges separately. The full analysis of these data is given in the CSR.
The reference values for acute aquatic toxicity, based on the lowest observed EC50 values of the corresponding databases at different pH and expressed as Zn++ ion concentration are:

- for pH <7: 0.413 mg Zn++/l (48 hr - Ceriodaphnia dubia test according to US EPA 821-R-02-012 standard test protocol; reference: Hyne et al 2005)
- for pH >7-8.5: 0.136 mg Zn++/l (72 hr - Selenastrum capricornutum (=Pseudokircherniella subcapitata) test according to OECD 201 standard protocol; reference: Van Ginneken, 1994)

As demonstrated by transformation/dissolution (T/D) testing according to OECD guidelines, zinc metal has limited solubility, as

compared to soluble zinc compounds. Especially the solubilisation of Zn++ ions of the massive forms of zinc is very limited. Applying the results of the T/D testing (CSR), the specific reference values for acute aquatic toxicity of zinc metal powder and massive forms, respectively, are:

For metallic zinc powders (based on 46% solubilisation capacity on finest powders and at most conservative loading of 1 mg/l at pH 8 (RA zinc, ECB 2008)):

- **for pH <7: 0.9 mg Zn/l** (based on 48 hr Ceriodaphnia dubia test cfr. above)
- **for pH >7-8.5: 0.3 mg Zn/l** (based on 72 hr Selenastrum capricornutum test cfr above)

M-factor: 1

For zinc in massive form (≥1mm diameter particle; based on a conservative estimate (for small particles) of 3.6% and 0.9% solubilisation capacity at pH 6 and pH 8, respectively. Solubilisation of zinc from the (larger size-) massive forms of zinc put on the EU market is much less than indicated by figures below):

- **for pH <7: 11.5 mg Zn/l** (based on 48 hr Ceriodaphnia dubia test cfr above)
- **for pH >7-8.5: 15.1 mg Zn/l** (based on 72 hr Selenastrum capricornutum test cfr above)

The classification of zinc metal in massive form is further based on the following elements:
- zinc is an essential element which is actively regulated throughout the food chain and does not bio-accumulate or bio-magnify (see also section 12.3.),
- zinc is rapidly removed from the water column and the removal rate under environmentally relevant conditions is >70% within 8 days. Moreover, zinc is actually sequestered in the sulphide fraction of sediments which will limit strongly its remobilisation to the water column (see also section 12.2.)

### *12.1.2 Chronic aquatic toxicity: freshwater*

The chronic aquatic toxicity database on zinc contains high quality chronic NOEC/EC10 values on 23 species (8 taxonomic groups) obtained under a variety of conditions. These data, outlined in the CSR, were compiled in a species sensitivity distribution, from which the PNEC was derived (expressed as Zn++ion concentration). This PNEC is an added value, i.e. it is to be added to the zinc background in water, see section 8.1.4 of SDS.

### *12.1.3 Chronic aquatic toxicity: marine waters*

The chronic aquatic toxicity database on zinc contains high quality chronic NOEC/EC10 values on 39 species (9 taxonomic groups) obtained under a variety of conditions. These data, outlined in the CSR, were compiled in a species sensitivity distribution, from which the PNEC was derived (expressed as Zn++ion concentration). This PNEC is an added value, to be added on the zinc background in water, see section 8.1.4 of SDS.

### *12.1.4 Sediment toxicity*

The chronic toxicity of zinc to sediment organisms in the freshwater was assessed based on a database containing high quality chronic NOEC/EC10 values on 7 benthic species obtained under a variety of conditions. These data, outlined in the CSR, were compiled in a species sensitivity distribution, from which the PNEC was derived (expressed as total Zn contained in the sediment). This PNEC is an added value, to be added on the zinc background in the sediment, see table below. For the marine sediments, a PNEC was derived using the equilibrium partitioning approach, see section 8.1.4 of SDS.

### *12.1.5 Soil toxicity*

The chronic toxicity of zinc to soil organisms was assessed based on a database containing high quality chronic NOEC/EC10 values on 18 plant species, 8 invertebrate species and 17 microbial processes, obtained under a variety of conditions. These data, outlined in the CSR, were compiled in a species sensitivity distribution, from which the PNEC was derived (expressed as total Zncontained in the soil). This PNEC is an added value, to be added on the zinc background in the soil, see section 8.1.4 of SDS.

### *12.1.6 Toxicity to micro-organisms in STP*

The PNEC for STP was derived by applying an assessment factor to the lowest relevant toxicity value: 5,2mg Zn/l (Dutka et al., 1983)

## *12.2. Persistence and degradability*

Zinc is an element, and as such the criterion “persistence” is not relevant for the metal and its inorganic compounds in a way as it is applied to organic substances.

An analysis on the removal of zinc from the water column has been presented as a surrogate for persistence. According to the EU guidance on classification and labelling, a substance is not classified for chronic aquatic toxicity if it is rapidly removed from the water column. The rapid removal of zinc (>70% removal within 28 days) from the water column under environmentally relevant conditions is documented in the CSR. The insolubility of ZnS formed in sediment prevents the re-mobilisation of zinc into the water column. As a result, zinc does not meet the “persistence” criterion.

## *12.3. Bioaccumulative potential*

Zinc is a natural, essential element, which is needed for the optimal growth and development of all living organisms, including man. All living organisms have homeostasis mechanisms that actively regulate zinc uptake and absorption/excretion from the body; due to this regulation, zinc and zinc compounds do not bioaccumulate or biomagnify, so zinc has no bioaccumulation potential.

## *12.4. Mobility in soil*

For zinc (like for other metals) the transport and distribution over the different environmental compartments e.g. the water (dissolved fraction, fraction bound to suspended matter), soil (fraction bound or complexed to the soil particles, fraction in the soil pore water,...) is described and quantified by the metal partition coefficients between these different fractions. In the CSR, a solids-water partitioning coefficient of 158.5 l/kg (log value 2.2) was applied for zinc in soils (CSR zinc 2010).

## *12.5. Results of PBT and vPvB assessment*

Considering the items 12.2 and 12.3 above, zinc and zinc compounds are not PBT or vPvB.

**Other adverse effects**

- Ozone depletion potential: this material does not contain ozone depleting substances
- Photochemical ozone creation potential: not applicable
- Global warming potential: not applicable
- Effects on waste water treatment plants: not known

## SECTION 13: DISPOSAL CONSIDERATIONS

Waste disposal methods must comply with national and local disposal or discharge laws.
This product should be recycled.

## SECTION 14: TRANSPORT INFORMATION

**Pacing**: ingots bound together in packets, jumbos

**UN-nr**: not applicable
**Code IMDG**: not applicable
**ICAO/IATA**: not applicable
**RID/ADR**: not applicable

## SECTION 15: REGULATORY INFORMATION

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

Safety, health and environmental regulations/Legislation specific for the substance or mixture
EU Regulation (EC) No. 1907/2006 (REACH)
Annexe XIV – List of substances subject to authorization
Substances of very high concern
None of the components are listed.

Annex XVII – Restrictions : Restricted to professional users on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Other EU Regulations

| | |
|---|---|
| Europe inventory: | All components are listed or exempted |
| Black List Chemicals: | Not listed |
| Priority List Chemicals: | Listed |
| Integrated pollution prevention and control list (IPPC) – Air: | Listed |
| Integrated pollution prevention and control list (IPPC) – Water: | Listed |

| Product/ingredient name | List name | Name on list | Classification | Notes |
|---|---|---|---|---|
| Lead | Belgium Carcinogen chemicals | Blei | Carc. | - |

International regulations

Chemical weapons Convention List Schedule I Chemicals: Not listed

Chemical weapons Convention List Schedule II Chemicals: Not listed

Chemical weapons Convention List Schedule III Chemicals: Not listed

### *15.2. Chemical Safety Assessment*

This product contains substances for which Chemical Safety Assessments are still required.

## SECTION 16: OTHER INFORMATION

### *16.1. List of uses for which a Generic Exposure Scenario (GES) is provided as annex*

Numerous uses were identified for ZnSO4. These are listed in table in annex, with the indication of the Generic Exposure Scenario (GES) that is relevant to these identified uses.

### *16.2. References*


- ACGIH (1991). American Conference of Governmental Industrial Hygienists Inc., Documentation of the threshold limit values and biological exposure indices, 6th edition.
- Arbejdstilsynet (1992). Grænseværdier for stoffer og materialer. Copenhagen, Denmark, Arbejdstilsynet
- Arts, MHE (1996). Acute (4-hour) inhalation toxicity study with Zinc powder in rats. EU risk assessment zinc metal, 2004. Testing laboratory: TNO, Zeist, The Netherlands. Report no.: TNO-report V96.734.
- Chemical Safety report (CSR) zinc. 2010.
- Conner MW, Flood WH and Rogers AE (1988). Lung injury in guinea pigs caused by multiple exposures to ultra fine zinc oxide. Changes in pulmonary lavage fluid. J. Toxicol. Environ. Health 25, 57-69
- Deutsche Forschungsgemeinschaft (DFG): Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe. MAK- und BAT-Werte-Liste (1997). Maximale Arbeitsplatzkonzentrationen und biologische Arbeitsstofftoleranzwerte.Weinheim, FRG.
- Dutka BJ, Nyholm N and Petersen J. 1983. Comparison of several microbiological toxicity screening tests. Water research volume 17, nr10, 1363-1368
- European Commission – Joint Research Centre, Institute for Health and Consumer Protection, European Chemicals Bureau (ECB). 2008. European Union Risk Assessment Report Zinc metal, Volume 42. Final report. (S.J. Munn et al. eds.) 812 pp.
- Gordon T, Chen LC, Fine JM, Schlesinger RB, Su WY, Kimmel TA and Amdur MO (1992). Pulmonary effects of inhaled zinc oxide in human subjects, guinea-pigs, rats, and rabbits. Am. Ind. Hyg. Assoc. J. 53, 503-509
- Heydon JL and Kagan AN (1990). Metal fume fever. N. Z. Med. J. 103, 52
- HSE (1998). Health and Safety Executive. Occupational exposure limits 1998. Sudbury, England: HSE Books.
- Hyne R.V., Pablo F, Moreno J; , Markisch S.J. et al 2005. Influence of water chemistry on the acute toxicity of copper and zinc to the cladoceran Ceriodaphnia dubia. Environm. Toxic. & Chemistry 24,1667-1675.

- Lam HF, Conner MW, Rogers AE, Fitzgerald S and Amdur MO (1985). Functional and morphologic changes in the lungs of guinea pigs exposed to freshly generated ultra fine zinc oxide. Toxicol. Appl. Pharmacol. 78, 29-38
- Lam HF, Chen LC, Ainsworth D, Peoples S and Amdur MO (1988). Pulmonary function of guinea pigs exposed to freshly generated ultra fine zinc oxide with and without spike concentrations. Am. Ind. Hyg. Assoc. J. 49, 333-341
- Lansdown ABG (1991). Interspecies variations in response to topical application of selected zinc compounds. Fd Chem Toxic 29 (1): 57-64. Testing laboratory: Charing Cross and Westminster Medical School, Department of Comparative Biology, London, UK.
- Löser E (1977). Acute oral toxicity and skin and eye irritation studies. EU risk assessment for zinc oxide 2004. Testing laboratory: Bayer Institut für Toxikologie, Wuppertal-Elberfeld.
- Mueller EJ and Seger DL (1985). Metal fume fever - a review. J. Emerg. Med. 2, 271-274
- National Board of Occupational Safety and Health (1993). Occupational exposure limit values. Solna, Sweden.
- Occupational Safety and Health Administration, OSHA (1989). U.S. Department of Labor.
- Prinsen MK (1996). Acute oral toxicity study (limit study) with zinc powder in rats. EU Risk Assessment Zinc metal 2004. Testing laboratory: TNO, Zeist, The Netherlands. Report no.: TNO-report V96.515.
- SZW (1997). Ministerie van Sociale Zaken en Werkgelegenheid. Nationale MAC-lijst 1997-1998. The Hague, The Netherlands.
- Van Ginneken, 1994. The effect of zinc oxide on the growth of the unicellular green algae Selenastrum capricornutum. Janssen Pharmaceutica Beerse, B. Report AASc/0022, 16-8-1994.
- Van Huygevoort AHBM (1999c). Acute eye irritation/corrosion study with zinc dust in the rabbit. Project 254363. NOTOX B.V., 's-Hertogenbosch, The Netherlands.
- Van Huygevoort AHBM (1999d). Acute eye irritation/corrosion study with zinc powder in the rabbit. Project 255072. NOTOX B.V., 's-Hertogenbosch, The Netherlands.
- Van Huygevoort AHBM (1999g). Assessment of contact hypersensitivity to Zincweiß Pharma A in the albino guinea pig (maximisation-test). Project 263429. NOTOX B.V., 's-Hertogenbosch, The Netherlands.
- Van Huygevoort AHBM (1999 h1). Assessment of contact hypersensitivity to zinc oxide in the albino guinea pig (maximisation-test). Project 254339. NOTOX B.V., 's-Hertogenbosch, The Netherlands.
- Van Huygevoort AHBM (1999 h2). Assessment of contact hypersensitivity to zinc oxide in the albino guinea pig (maximisation-test). (An extension of NOTOX Project 254339). Project 261214. NOTOX B.V., 's-Hertogenbosch, The Netherlands.


**Revision information:**
Version 1
In all sections.

Wilhelm Grillo Handelsgesellschaft mbH, Am Grillopark 5, 47169 Duisburg

Safety Data Sheet according to Regulation No. EC 1907/2006

Remelted Zinc

---

Version: 1

Revision date: July 2020 Printing date: 24th July 2020

---

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

### *1.1. Identification of the substance or preparation*

| | |
|---|---|
| Product name: | Remelted zinc (ZS1, ZS2, ZSA according to prEN13283) |
| Chemical name: | not applicable |
| Formula: | not applicable |
| CAS number: | 7440-66-6 |
| Product code: - | |
| Use of the substance/preparation: | Industrial applications |
| REACH registration number: | 01-2119467174-37-XXXX |

### *1.2. Relevant uses and uses advised against*

- Corrosion inhibitors and anti-scaling agents
- Plating agents and metal surface treating agents
- Laboratory chemicals
- Reducing agents
- Alloying element / castings / sheets / coils / anodic protection / battery component

A complete list of uses for which a Generic Exposure Scenario (GES) is provided in the annex introduction.

➔ no uses advised against

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

Company Name
Wilhelm Grillo Handelsgesellschaft mbH, Am Grillopark 5, 47169 Duisburg, Deutschland/Germany
Tel.: +49 203 40 66 – 0 / Fax: +49 203 40 66 – 114
http://www.grillohandel.de – e-mail: reach@grillohandel.de

### *1.4. Emergency telephone number*

## SECTION 2: HAZARDS IDENTIFICATION

### *2.1. Classification of the substance or mixture*

**Classification according to Regulation (EC) No 1272/2008 as amended**

Not classified as dangerous according to the criteria of Regulation (EC) No 1272/2008.

### *2.2. Label elements*

Not classified as dangerous according to the criteria of Regulation (EC) No 1272/2008.

## 2.3. Other hazards

During treatment and at high temperatures, zinc or zinc oxide furmes may arise. Inhalation of these fumes may cause zinc fever, with symptoms of "influenza". Inhalation of zinc dust may cause gastro-intestinal disorder. Zinc fumes may cause local eye irritation.
An excessive exposure (inhalation and/or ingestion) to fumes or dust containng lead may lead to : reduced appetiten anaemia, insomnia, headache, excitedness, myalgy and athralgy, muscle weakening, gastritis and liver affections.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substances

Description : zinc metal in different forms

**Constituents**

| Constituent | Typical concentration | Concentration range | Remarks | Classification according to CLP |
|---|---|---|---|---|
| Zinc<br>CAS: 7440-66-6<br>EC no. : 231-175-3 | <= 99.995 % (w/w) | > 98 - <= 99.995 % (w/w) | Covers secondary and primary SHG zinc | Not classified |

**Impurities**

| Impurity | Typical concentration | Concentration range | Remarks |
|---|---|---|---|
| Lead<br><br>EC no. : 231-100-4 | <= 30.0 ppm | | Lead can be as high as 1.5 %<br>For secondary zinc grades |

**Typical composition**

| Components | Weight % |
|---|---|
| Pb | < 1.5 % |
| Cd | < 0.05 % |
| Fe | < 0.12 % |
| Al | < 0.1 % |
| Cu | < 0.1 % |
| Sn | < 0.7 % |

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of first aid measures

**Inhalation**

In case of inhalation of dust or fume, terminate exposure immediately and move to fresh air. Contact a physician.

**Ingestion**

Upon ingestion of dust, contact a physician.

**Skin**

Wash the skin with soap and water. Get medical attention if irritation develops.

**Eyes**

Rinse eyes with large amounts of water, including eyelids. Get medical attention if irritation develops:

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

Irritation of eyes and mucous membranes. Irritation of nose and throat. Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain.

## SECTION 5: FIREFIGHTING MEASURES

| | |
|---|---|
| **Suitable extinguishing media:** | dry sand, CO2 |
| **Extinguishing media not to be used:** | no specific measures |
| **Special exposure hazards:** | see heading 11 |
| **Special protective equipment for fire-fighters:** | fire-fighters should wear proper protective clothing and self-contained breathing apparatus |

## SECTION 6: ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| **Personal precautions:** | Avoid creating dust. Wear approved respirators (type P2 or P3) when exposed to dust or fume |
| **Environmental precautions:** | prevent the material from spilling to the surface waters |
| **Methods for cleaning up:** | collect spilled product for reuse, preferably by vacuuming. Avoid dusting |

## SECTION 7: HANDLING AND STORAGE

**Handling**

Avoid contact with skin. Avoid generating dust or fumes. Avoid breathing fumes or dust.
Wear approved respirators if adequate ventilation is not possible.

**Storage**

Zinc ingots may contain voids that could be a site of water accumulation and/or precipitation.
If ingots are remelted with such accumulation, a potentially hazardeous situation could exist.
Storage to avoid such accumulation should be utilized.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OELs for ZnCl2 – group: soluble zinc compounds

(e.g.: $ZnCl_2$ – $ZnSO_4$ - $Zn(H_3PO4)_2$ – $ZnCl_2/2NH_4Cl$ – $ZnCl_2/3NH_4$ Cl)

| Country/organisation | 8 hour-TWA mg/m³ | 15 min-STEL mg/m³ | References |
|---|---|---|---|
| USA | 1 | 2 | ACGIH (1991) |
| The Netherlands | 1 | | SZW (1997) |
| UK | 1 | 2 a) | HSE (1998) |
| Sweden | 1b | | National Board of Occupational Safety and Health, Sweden (1993) |
| Denmark | 0.5 | | Arbejdstilsynet, 1992 |

a) This value is a 10 minutes-STEL

b) This TWA is determined for dust

OELs for ZnO – group: "slightly soluble / insoluble Zn compounds"

(e.g.: ZnO - $Zn(OH)_2$ – $Zn_3(PO4)_2$ – $ZnCO_3$ - Zn metal – ZnS)

| Country/organisation | 8 hour-TWA mg/m³ | 15 min-STEL mg/m³ | References |
|---|---|---|---|
| USA | 5 (fumes) | 10 (fumes) | ACGIH (1991) (guidance values) |
| USA | 5 (fumes)<br>15 (dust; total)<br>5 (dust; respirable) | | OSHA (1989) (legal limit values) |
| The Netherlands / Belgium | 5 (fumes) | | SZW (1997) / ARAB 1999 |
| Germany | 5 (fumes)<br>6 (dust) | | DFG (1997) |
| UK | 5 (fumes)<br>10 (dust) | | HSE (1998) |
| Sweden | 5 (fumes) | | National Board of Occupational Safety and Health, Sweden (1993) |
| Denmark | 4 (fumes)<br>10 (dust) | | Arbejdstilsynet, 1992 |

OEL for Pb lead, inorganis compounds , fumes and dust

| | | | |
|---|---|---|---|
| Belgium | 0,15 mg/m³ | | ARAB 1999 |

## *8.1. DNELs and PNECs*

DNELs

- **Oral**
  - o $DNEL_{oral\ soluble\ Zn}$ = 50 mg Zn/day (i.e., 0.83 mg Zn/kg bw/day);
  - o $DNEL_{oral\ insoluble\ Zn}$ = 50 mg Zn/day (i.e., 0.83 mg Zn/kg bw/day);
- **Dermal**
  - o $DNEL_{dermal\ soluble\ Zn}$ = 500 mg Zn/day (i.e., 8.3 mg Zn/kg bw/day);
  - o $DNEL_{dermal\ insoluble\ Zn}$ = 5000 mg Zn/day (i.e., 83 mg Zn/kg bw/day);
- **Inhalation – Worker**
  - **o** $DNEL_{inhal\ soluble\ Zn\ (worker)}$ = 1 mg $Zn/m_3$;
  - o $DNEL_{inhal\ insoluble\ Zn\ (worker)}$ = 5 mg $Zn/m_3$;
- **Inhalation – Consumer**
  - **o** $DNEL_{inhal\ soluble\ Zn\ (consumer)}$ = 1.3 mg $Zn/m_3$;
  - **o** $DNEL_{inhal\ insoluble\ Zn\ (consumer)}$ = 2.5 mg $Zn/m_3$;

PNECs derived for the zinc ion

| Compartment (Environment) | PNEC value for Zn ion |
|---|---|
| Freshwater | 20.6* µg/L |
| Saltwater | 6.1* µg/L |
| STP | 52 µg/L |
| Freshwater sediment | 117.8* mg/kg sediment d.w.<br>A generic bioavailability factor of 0.5 is applied by default: $PNEC_{bioav}$: 235.6 mg/kg sediment d.w. |
| Saltwater sediment | 56.5* mg/kg sediment d.w.<br>A generic bioavailability factor of 0.5 is applied by default: $PNEC_{bioav:}$ 113 mg/kg sediment d.w. |
| Soil | 35.6* mg/kg soil d.w.<br>A generic bioavailability/ageing factor of 3 is applied by default: $PNEC_{bioav}$: 106.8 mg/kg soil d.w. |
| Oral | No potential for bioaccumulation |

*added value

Calculation of local exposure- Bioavailability correction

The local exposure at a given site can be calculated specifically using the excel sheet prepared by Arche (see "DU scaling tool" on the "tools" page on http://www.reach-zinc.eu/)
In addition, bioavailability corrections can be integrated in the exposure assessment, if the environmental parameters that are needed for the calculations, are documented.

- For water assessment, bioavailability model correction can be applied when the following water parameters are documented for the receiving water: Dissolved organic carbon (DOC), pH, hardness or Ca-concentration. For the calculations, the "zinc BLM-calculator" excel tool is used to this end (see "tools" on http://www.reach-zinc.eu/). When the local values of these parameters are unknown, regional data can be used as an alternative. Use of regional instead of local values should always be handled with caution.
- For sediment, a generic bioavailability factor of 2 is already integrated in the PNEC, based on AVS/SEM levels and according to the risk assessment (ECB 2008). A further refinement of local bioavailability can be made when local AVS/SEM concentrations are documented. The bioavailable fraction of zinc is given by subtracting local AVS from local SEM-Zn (SEM-Zn - AVS).
- For soil, a worst case bioavailability correction (corresponding to sandy soils) is already integrated. Further refinement for zinc bioavailability in other soil types is possible, when the local soil type is documented, together with pH, CEC (see "tools" on http://www.reach-zinc.eu/)

## *8.2. Exposure controls*

### *8.2.1 Appropriate engineering controls*

Technical conditions and measures at process level (source) to prevent release

- Process enclosures or semi-enclosures where appropriate.
- Local exhaust ventilation on furnaces and other work areas with potential dust generation, dust capturing and removal techniques
- Containment of liquid volumes in sumps to collect/prevent accidental spillage

Technical conditions and measures to control dispersion from source towards the worker

- Local exhaust ventilation system (high efficiency 90-95%)
- Cyclones/filters (for minimizing dust emissions) : efficiency: 70-90% (cyclones), 50-80% (dust filters), 85-95% (double stage, cassette filters)
- Process enclosure, especially in potentially dusty units
- Dust control: dust and Zn in dust needs to be measured in the workplace air (static or individual) according to national regulations.
- Special care for the general establishment and maintenance of a clean working environment by e.g.:
  - Cleaning of process equipment and workshop
  - Storage of packaged Zn finished product in dedicated zones

Organisational measures to prevent /limit releases, dispersion and exposure

In general integrated management systems are implemented at the workplace e.g. ISO 9000, ISO 14000 are IPPC-compliant.

Such management system would include general industrial hygiene practice e.g.:

- information and training of personnel on prevention of exposure/accidents,
- procedures for control of personal exposure (hygiene measures)
- regular cleaning of equipment and floors, extended workers instruction-manuals
- Procedures for process control and maintenance...
- personal protection measures (see below)

### *8.2.2 Personal protection*

- Wearing of gloves and protective clothing is compulsory (efficiency >=90%).
- With normal handling, no respiratory personal protection (breathing apparatus) is necessary.
  If risk for exceedance of OEL/DNEL, use e.g.:
  - Dust filter-half mask P1 (efficiency 75%)
  - Dust filter-half mask P2 (efficiency 90%)
  - Dust filter-half mask P3 (efficiency 95%)
  - Dust filter-full mask P1 (efficiency 75%)
  - Dust filter-full mask P2 (efficiency 90 %)
  - Dust filter-full mask P3 (efficiency 97.5%)
- Eyes: safety glasses are optional
- Skin protection :
  Wear protective clothing. Remove contaminated clothing before leaving work areas.
- Personal hygiene :
  Practice good housekeeping and personal hygiene procedures. Do not eat, drink or smoke in the work areas. Wash hands thoroughly before eating, drinking or smoking. Avoid inhalation and ingestion of smoke or fumes, avoid contact with skin and eyes. Don't take contaminated clothing home.
- Information-training of the workers and their staff and line managers focused on careful hygiene behaviour.

### *8.2.3 Environmental exposure control*

Technical conditions and measures at process level (source) to prevent release

- Process enclosures and closed circuits where relevant
- Careful use of sulphuric acid and corrosive solutions, if used
- When applicable, sump containment is provided under the tanks and the filters i.o. to collect any accidental spillage and process waters need to be specifically treated before release
- Dusty operations occur under a specific local ventilation hood
- Process air is filtered before release outside the building

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

- On-site waste water treatment techniques are (if applicable) e.g.:
  chemical precipitation, sedimentation, filtration (efficiency 90-99.98%).
- Containment of liquid volumes in sumps to collect/prevent accidental spillage
- Air emissions are controlled by use of bag-house filters and/or other air emission abatement devices e.g.
  fabric (or bag) filters (up to 99% efficiency), wet scrubbers (50-99% efficiency). This may create a general negative pressure in the building. Air emissions are continuously monitored.

Organizational measures to prevent/limit release from site

- In general emissions are controlled and prevented by implementing an integrated management system e.g.
  ISO 9000, ISO 1400X series, or alike, and, when applicable, by being IPPC-compliant.
  - Such management system should include general industrial hygiene practice e.g.:
    - information and training of workers,
    - regular cleaning of equipment and floors,
    - procedures for process control and maintenance...
- Treatment and monitoring of releases to outside air, and exhaust gas streams (process & hygiene), according to national regulation.
- SEVESO 2 compliance.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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

Overview of physico-chemical properties (from CSR).

| Property | Results |
|---|---|
| a) Appearance at 20°C and 1013 hPa | The physical state of the substance is either<br>1) solid massive metal, its colour is shiny silver |
| 2) odour | odourless |
| 3) odour threshold | Not applicable |
| 4) pH | Not applicable |
| 5) Melting / freezing point | In air zinc powder starts melting at 409°C;<br>In air, cast zinc particles start melting 416°C; |
| 6) Boiling point | Not applicable to solids with melting point >300°C (Column 2 of Annex VII of REACH regulation) |
| 7) Flash point | Not applicable to inorganic substances (Column 2 of Annex VII of REACH regulation) |

| | |
|---|---|
| 8) Evaporation rate | Not applicable to solids |
| 9) Flammability | All grades of zinc powder were not to be considered as flammable. |
| 10) Upper/lower flammability or explosive limits | Not applicable - To be checked and specified if needed |
| 11) Vapour pressure | Not applicable if the melting point is above 300°C (Column 2 of Annex VII REACH regulation) |
| 12) Vapour density | Not applicable |
| 13) Relative density | The density of the substance is 6.9 g/cm$^3$ in powder form, 7.1 g/cm$^3$ in particulate form. |
| 14) Water solubility | The solubility of Zn powder was 0.1 mg/l. Zinc in massive form has very limited solubility |
| 15) Partition coefficient: n-octanol-water | Not applicable to metals; not applicable if the substance is inorganic (column 2 of Annex VII of the REACH regulation) |
| 16) Auto-ignition temperature | The substance is not auto-flammable |
| 17) Decomposition temperature | Not applicable |
| 18) Viscosity | Viscosity of the substance was determined on molten liquid substance. The results show that the viscosity of liquid metal zinc is increasing slowly as a function of decreasing temperature (between 417 -521°C) until the melting point is reached. Here, the melting point seems to be at 417.4 °C. At the melting point, the rapid increase of the viscosity ended the measurement automatically. |
| 19) Explosive properties | In general, based on the TG/DSC measurements and mineral composition, zinc has no flammability, explosive or self-flammability properties. However, hydrogen gas is formed in reaction with water, and thereby zinc has in certain powder forms also flammability and explosive properties. (Outotec 2010) This is reflected by the specific classification of "zinc powder, stabilised" and "zinc powder, pyrophoric". |
| 20) Explosive properties | In general, based on the TG/DSC measurments and mineral composition, zinc has no flammability, explosive or self-flammability properties. However, hydrogen gas id formed in reaction with water, and thereby zinc has in certain powder forms also flammability and explosive properties (Outotec 2010). This is reflected by the specific classification of “zinc powder, stabilised” and “zinc powder, pyrophoric”. |
| Granulometry | The D50 of the tested zinc powder is 71 µm, the D80 is 148 µm |

## SECTION 10: STABILITY AND REACTIVITY

The product is stable in normal circumstances.

**Conditions to avoid**

Contact with water or incompatible materials.

**Materials to avoid**

Acids, oxidizing agents.

**Hazardous decomposition products**

Upon heating, a toxic fume of lead and zinc compounds may occur.

## SECTION 11: TOXICOLOGICAL INFORMATION

**Acute toxicity**

Inhalation

Pb: an excessive exposure (inhalation/ingestion) to fumes or dust containing lead may lead to : reduced appetite, anaemia, nausea, insomnia, headache, excitedness, myalgy and athralgy, muscle weakening, gastritis and liver affections.

Zn:

| Product/ingredient name | Result | Species | Dose | Exposure | Refs |
|---|---|---|---|---|---|
| Zinc powder | LC50 Inhalation Dusts and mists | Rat | >5.4 mg/L | 4 hours | Arts (1996) |
| Zinc powder | LD50 Oral | Rat | >2000 mg/kg | NA | Prinsen (1996) |

With $LD_{50}$ values consistently exceeding 2,000 mg/kg bw, slightly soluble compounds such as, zinc (LD50 >2,000mg/kg bw) show low level of acute oral toxicity, not leading to classification for acute oral toxicity
Zinc metal is shown to be of low acute inhalation toxicity (i.e., LC50 values of > 5.41 mg/L/4hrs), not leading to classification for acute inhalation toxicity

Skin
No skin irritation or sensitivity was reported.
Eyes
Zinc fumes may cause local eye irritation.

**Irritation/Corrosion**

Skin: not irritant (based on cross-reading from slightly soluble Zn compound, Zinc oxide, (Löser, 1977; Lansdown, 1991))
Eye: not irritant (Van Huygevoort, 1999 c, d)
Respiratory tract: not irritant (based on cross-reading from slightly soluble Zn compound, Zinc oxide, (Klimish et al, 1982)

**Sensitization**

No sensitizing effects known (based on cross-reading from slightly soluble Zn compound, Zinc oxide (Van Huygevoort, 1999 g, h)

**Germ cell mutagenicity**

No biologically relevant genotoxic activity (based on cross-reading between Zn compounds; no classification for mutagenicity required) (Chemical Safety report (CSR) zinc. 2010)

**Carcinogenicity**

No experimental or epidemiological evidence exists to justify classification of zinc compounds for carcinogenic activity (based on cross-reading between Zn compounds; no classification for carcinogenicity required) (Chemical Safety report (CSR) zinc. 2010)

**Reproductive toxicity**
No experimental or epidemiological evidence exists to justify classification of zinc compounds for reproductive or developmental toxicity (based on cross-reading between Zn compounds; no classification for reproductive toxicity required) (Chemical Safety report (CSR) zinc. 2010)

**Specific target organ toxicity (single exposure)**
No experimental or epidemiological sufficient evidence for specific target organ toxicity (single exposure) (based on cross-reading from ZnO; no classification for target organ toxicity (single exposure: STOT-SE) required) (Heydon and Kagan, 1990; Gordon et al., 1992; Mueller and Seger, 1985 [Cited in Chemical Safety report (CSR) zinc. 2010)]).

**Specific target organ toxicity (repeated exposure)**
Zn:
No experimental or epidemiological sufficient evidence for specific target organ toxicity (repeated exposure) (based on cross-reading from ZnO; no classification for specific target organ toxicity (repeated exposure: STOT-RE) required) (Lam et al, 1985, 1988; Conner et al., 1988 [Cited in Chemical Safety report (CSR) zinc. 2010)]).

Pb:
Long term inhalation of lead containing dust or fume may weaken and/or damage the nerve system and the immunosystem, as well as an increase of systolic blood prssure and risk of kidney damage.
Zn is relatively non-toxic and chronic effects were not reported.

**Aspiration hazard**
Not available

**Irritation/sensitization**
Sensitivity of the skin was not reported. Zinc fumes are irritating for the eyes.

## SECTION 12: ECOLOGICAL INFORMATION

### *12.1. Toxicity*

#### *12.1.1 Acute aquatic toxicity*

The Acute aquatic toxicity database on zinc contains data on 11 standard species obtained under standard testing conditions at different pH and hardness. Since the transformation/dissolution of zinc metal is dependent on pH, the available acute aquatic toxicity dataset has also been considered for 2 different pH ranges separately. The full analysis of these data is given in the CSR.
The reference values for acute aquatic toxicity, based on the lowest observed EC50 values of the corresponding databases at different pH and expressed as Zn++ ion concentration are:

- for pH <7: 0.413 mg Zn++/l (48 hr - Ceriodaphnia dubia test according to US EPA 821-R-02-012 standard test protocol; reference: Hyne et al 2005)
- for pH >7-8.5: 0.136 mg Zn++/l (72 hr - Selenastrum capricornutum (=Pseudokircherniella subcapitata) test according to OECD 201 standard protocol; reference: Van Ginneken, 1994)

As demonstrated by transformation/dissolution (T/D) testing according to OECD guidelines, zinc metal has limited solubility, as

compared to soluble zinc compounds. Especially the solubilisation of Zn++ ions of the massive forms of zinc is very limited. Applying the results of the T/D testing (CSR), the specific reference values for acute aquatic toxicity of zinc metal powder and massive forms, respectively, are:

For metallic zinc powders (based on 46% solubilisation capacity on finest powders and at most conservative loading of 1 mg/l at pH 8 (RA zinc, ECB 2008)):

- **for pH <7: 0.9 mg Zn/l** (based on 48 hr Ceriodaphnia dubia test cfr. above)
- **for pH >7-8.5: 0.3 mg Zn/l** (based on 72 hr Selenastrum capricornutum test cfr above)

M-factor: 1

For zinc in massive form (≥1mm diameter particle; based on a conservative estimate (for small particles) of 3.6% and 0.9% solubilisation capacity at pH 6 and pH 8, respectively. Solubilisation of zinc from the (larger size-) massive forms of zinc put on the EU market is much less than indicated by figures below):

- **for pH <7: 11.5 mg Zn/l** (based on 48 hr Ceriodaphnia dubia test cfr above)
- **for pH >7-8.5: 15.1 mg Zn/l** (based on 72 hr Selenastrum capricornutum test cfr above)

The classification of zinc metal in massive form is further based on the following elements:
- zinc is an essential element which is actively regulated throughout the food chain and does not bio-accumulate or bio-magnify (see also section 12.3.),
- zinc is rapidly removed from the water column and the removal rate under environmentally relevant conditions is >70% within 8 days. Moreover, zinc is actually sequestered in the sulphide fraction of sediments which will limit strongly its remobilisation to the water column (see also section 12.2.)

### *12.1.2 Chronic aquatic toxicity: freshwater*

The chronic aquatic toxicity database on zinc contains high quality chronic NOEC/EC10 values on 23 species (8 taxonomic groups) obtained under a variety of conditions. These data, outlined in the CSR, were compiled in a species sensitivity distribution, from which the PNEC was derived (expressed as Zn++ion concentration). This PNEC is an added value, i.e. it is to be added to the zinc background in water, see section 8.1.4 of SDS.

### *12.1.3 Chronic aquatic toxicity: marine waters*

The chronic aquatic toxicity database on zinc contains high quality chronic NOEC/EC10 values on 39 species (9 taxonomic groups) obtained under a variety of conditions. These data, outlined in the CSR, were compiled in a species sensitivity distribution, from which the PNEC was derived (expressed as Zn++ion concentration). This PNEC is an added value, to be added on the zinc background in water, see section 8.1.4 of SDS.

### *12.1.4 Sediment toxicity*

The chronic toxicity of zinc to sediment organisms in the freshwater was assessed based on a database containing high quality chronic NOEC/EC10 values on 7 benthic species obtained under a variety of conditions. These data, outlined in the CSR, were compiled in a species sensitivity distribution, from which the PNEC was derived (expressed as total Zn contained in the sediment). This PNEC is an added value, to be added on the zinc background in the sediment, see table below. For the marine sediments, a PNEC was derived using the equilibrium partitioning approach, see section 8.1.4 of SDS.

### *12.1.5 Soil toxicity*

The chronic toxicity of zinc to soil organisms was assessed based on a database containing high quality chronic NOEC/EC10 values on 18 plant species, 8 invertebrate species and 17 microbial processes, obtained under a variety of conditions. These data, outlined in the CSR, were compiled in a species sensitivity distribution, from which the PNEC was derived (expressed as total Zncontained in the soil). This PNEC is an added value, to be added on the zinc background in the soil, see section 8.1.4 of SDS.

### *12.1.6 Toxicity to micro-organisms in STP*

The PNEC for STP was derived by applying an assessment factor to the lowest relevant toxicity value: 5,2mg Zn/l (Dutka et al., 1983)

## *12.2. Persistence and degradability*

Zinc is an element, and as such the criterion “persistence” is not relevant for the metal and its inorganic compounds in a way as it is applied to organic substances.

An analysis on the removal of zinc from the water column has been presented as a surrogate for persistence. According to the EU guidance on classification and labelling, a substance is not classified for chronic aquatic toxicity if it is rapidly removed from the water column. The rapid removal of zinc (>70% removal within 28 days) from the water column under environmentally relevant conditions is documented in the CSR. The insolubility of ZnS formed in sediment prevents the re-mobilisation of zinc into the water column. As a result, zinc does not meet the “persistence” criterion.

## *12.3. Bioaccumulative potential*

Zinc is a natural, essential element, which is needed for the optimal growth and development of all living organisms, including man. All living organisms have homeostasis mechanisms that actively regulate zinc uptake and absorption/excretion from the body; due to this regulation, zinc and zinc compounds do not bioaccumulate or biomagnify, so zinc has no bioaccumulation potential.

## *12.4. Mobility in soil*

For zinc (like for other metals) the transport and distribution over the different environmental compartments e.g. the water (dissolved fraction, fraction bound to suspended matter), soil (fraction bound or complexed to the soil particles, fraction in the soil pore water,...) is described and quantified by the metal partition coefficients between these different fractions. In the CSR, a solids-water partitioning coefficient of 158.5 l/kg (log value 2.2) was applied for zinc in soils (CSR zinc 2010).

## *12.5. Results of PBT and vPvB assessment*

Considering the items 12.2 and 12.3 above, zinc and zinc compounds are not PBT or vPvB.

**Other adverse effects**

- Ozone depletion potential: this material does not contain ozone depleting substances
- Photochemical ozone creation potential: not applicable
- Global warming potential: not applicable
- Effects on waste water treatment plants: not known

## SECTION 13: DISPOSAL CONSIDERATIONS

Waste disposal methods must comply with national and local disposal or discharge laws.
This product should be recycled.

## SECTION 14: TRANSPORT INFORMATION

**Pacing**: ingots bound together in packets, jumbos

**UN-nr**: not applicable
**Code IMDG**: not applicable
**ICAO/IATA**: not applicable
**RID/ADR**: not applicable

## SECTION 15: REGULATORY INFORMATION

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

Safety, health and environmental regulations/Legislation specific for the substance or mixture
EU Regulation (EC) No. 1907/2006 (REACH)
Annexe XIV – List of substances subject to authorization
Substances of very high concern
None of the components are listed.

Annex XVII – Restrictions : Restricted to professional users on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Other EU Regulations

| | |
|---|---|
| Europe inventory: | All components are listed or exempted |
| Black List Chemicals: | Not listed |
| Priority List Chemicals: | Listed |
| Integrated pollution prevention and control list (IPPC) – Air: | Listed |
| Integrated pollution prevention and control list (IPPC) – Water: | Listed |

| Product/ingredient name | List name | Name on list | Classification | Notes |
|---|---|---|---|---|
| Lead | Belgium Carcinogen chemicals | Blei | Carc. | - |

International regulations

Chemical weapons Convention List Schedule I Chemicals: Not listed

Chemical weapons Convention List Schedule II Chemicals: Not listed

Chemical weapons Convention List Schedule III Chemicals: Not listed

### *15.2. Chemical Safety Assessment*

This product contains substances for which Chemical Safety Assessments are still required.

## SECTION 16: OTHER INFORMATION

### *16.1. List of uses for which a Generic Exposure Scenario (GES) is provided as annex*

Numerous uses were identified for ZnSO4. These are listed in table in annex, with the indication of the Generic Exposure Scenario (GES) that is relevant to these identified uses.

### *16.2. References*


- ACGIH (1991). American Conference of Governmental Industrial Hygienists Inc., Documentation of the threshold limit values and biological exposure indices, 6th edition.
- Arbejdstilsynet (1992). Grænseværdier for stoffer og materialer. Copenhagen, Denmark, Arbejdstilsynet
- Arts, MHE (1996). Acute (4-hour) inhalation toxicity study with Zinc powder in rats. EU risk assessment zinc metal, 2004. Testing laboratory: TNO, Zeist, The Netherlands. Report no.: TNO-report V96.734.
- Chemical Safety report (CSR) zinc. 2010.
- Conner MW, Flood WH and Rogers AE (1988). Lung injury in guinea pigs caused by multiple exposures to ultra fine zinc oxide. Changes in pulmonary lavage fluid. J. Toxicol. Environ. Health 25, 57-69
- Deutsche Forschungsgemeinschaft (DFG): Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe. MAK- und BAT-Werte-Liste (1997). Maximale Arbeitsplatzkonzentrationen und biologische Arbeitsstofftoleranzwerte.Weinheim, FRG.
- Dutka BJ, Nyholm N and Petersen J. 1983. Comparison of several microbiological toxicity screening tests. Water research volume 17, nr10, 1363-1368
- European Commission – Joint Research Centre, Institute for Health and Consumer Protection, European Chemicals Bureau (ECB). 2008. European Union Risk Assessment Report Zinc metal, Volume 42. Final report. (S.J. Munn et al. eds.) 812 pp.
- Gordon T, Chen LC, Fine JM, Schlesinger RB, Su WY, Kimmel TA and Amdur MO (1992). Pulmonary effects of inhaled zinc oxide in human subjects, guinea-pigs, rats, and rabbits. Am. Ind. Hyg. Assoc. J. 53, 503-509
- Heydon JL and Kagan AN (1990). Metal fume fever. N. Z. Med. J. 103, 52
- HSE (1998). Health and Safety Executive. Occupational exposure limits 1998. Sudbury, England: HSE Books.
- Hyne R.V., Pablo F, Moreno J; , Markisch S.J. et al 2005. Influence of water chemistry on the acute toxicity of copper and zinc to the cladoceran Ceriodaphnia dubia. Environm. Toxic. & Chemistry 24,1667-1675.

- Lam HF, Conner MW, Rogers AE, Fitzgerald S and Amdur MO (1985). Functional and morphologic changes in the lungs of guinea pigs exposed to freshly generated ultra fine zinc oxide. Toxicol. Appl. Pharmacol. 78, 29-38
- Lam HF, Chen LC, Ainsworth D, Peoples S and Amdur MO (1988). Pulmonary function of guinea pigs exposed to freshly generated ultra fine zinc oxide with and without spike concentrations. Am. Ind. Hyg. Assoc. J. 49, 333-341
- Lansdown ABG (1991). Interspecies variations in response to topical application of selected zinc compounds. Fd Chem Toxic 29 (1): 57-64. Testing laboratory: Charing Cross and Westminster Medical School, Department of Comparative Biology, London, UK.
- Löser E (1977). Acute oral toxicity and skin and eye irritation studies. EU risk assessment for zinc oxide 2004. Testing laboratory: Bayer Institut für Toxikologie, Wuppertal-Elberfeld.
- Mueller EJ and Seger DL (1985). Metal fume fever - a review. J. Emerg. Med. 2, 271-274
- National Board of Occupational Safety and Health (1993). Occupational exposure limit values. Solna, Sweden.
- Occupational Safety and Health Administration, OSHA (1989). U.S. Department of Labor.
- Prinsen MK (1996). Acute oral toxicity study (limit study) with zinc powder in rats. EU Risk Assessment Zinc metal 2004. Testing laboratory: TNO, Zeist, The Netherlands. Report no.: TNO-report V96.515.
- SZW (1997). Ministerie van Sociale Zaken en Werkgelegenheid. Nationale MAC-lijst 1997-1998. The Hague, The Netherlands.
- Van Ginneken, 1994. The effect of zinc oxide on the growth of the unicellular green algae Selenastrum capricornutum. Janssen Pharmaceutica Beerse, B. Report AASc/0022, 16-8-1994.
- Van Huygevoort AHBM (1999c). Acute eye irritation/corrosion study with zinc dust in the rabbit. Project 254363. NOTOX B.V., 's-Hertogenbosch, The Netherlands.
- Van Huygevoort AHBM (1999d). Acute eye irritation/corrosion study with zinc powder in the rabbit. Project 255072. NOTOX B.V., 's-Hertogenbosch, The Netherlands.
- Van Huygevoort AHBM (1999g). Assessment of contact hypersensitivity to Zincweiß Pharma A in the albino guinea pig (maximisation-test). Project 263429. NOTOX B.V., 's-Hertogenbosch, The Netherlands.
- Van Huygevoort AHBM (1999 h1). Assessment of contact hypersensitivity to zinc oxide in the albino guinea pig (maximisation-test). Project 254339. NOTOX B.V., 's-Hertogenbosch, The Netherlands.
- Van Huygevoort AHBM (1999 h2). Assessment of contact hypersensitivity to zinc oxide in the albino guinea pig (maximisation-test). (An extension of NOTOX Project 254339). Project 261214. NOTOX B.V., 's-Hertogenbosch, The Netherlands.


**Revision information:**
Version 1
In all sections.

Wilhelm Grillo Handelsgesellschaft mbH, Am Grillopark 5, 47169 Duisburg

Safety Data Sheet according to Regulation No. EC 1907/2006

Zinc-Nickel Alloy

---

Version: 1

Revision date: July 2021 Printing date: 9th July 2021

---

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

### *1.1. Product identifier*

| | |
|---|---|
| Trade name: | Zinc-Nickel Alloy |
| Product no.: | 5XXX |
| REACH registration number.: | Not applicable |
| Other means of identification: | ZiNiGal, ZiNiGal Light, ZiNiGal Plus, ZiNiGal Bright, ZiNiGal-Light-Bright |

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

**Relevant identified uses of the substance or mixture**

Hot dip galvanizing.

**Uses advised against**

No uses advised against

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

Company Name

Wilhelm Grillo Handelsgesellschaft mbH, Am Grillopark 5, 47169 Duisburg, Deutschland/Germany

Tel.: +49 203 40 66 – 0 / Fax: +49 203 40 66 – 114

http://www.grillohandel.de – e-mail: reach@grillohandel.de

### *1.4. Emergency telephone number*

## SECTION 2: Hazards Identification

### *2.1. Classification of the substance or mixture*

-

### *2.2. Label elements*

| | |
|---|---|
| **Hazard pictogram(s)** | - |
| **Signal word** | - |
| **Hazard statement(s)** | - |

**Safety statement(s)**

| | |
|---|---|
| **General** | - |
| **Prevention** | - |
| **Response** | - |
| **Storage** | - |
| **Disposal** | - |

**Identity of the substances primarily responsible for the major health hazards**

## 2.3. Other hazards

This product contains substances which are considered or proven to be carcinogenic.

**Additional labelling**

Contains Nickel. May produce an allergic reaction. (EUH208)

**Additional warnings**

-

**VOC**

-

## SECTION 3: Composition/information on ingredients

## 3.1. Substances

-

## 3.2. Mixtures

| | |
|---|---|
| NAME: | Zinc |
| IDENTIFICATION NOS: | CAS-no: 7440-66-6 EC-no: 231-175-3 REACH-no: 01-2119467174-37 Index-no: 030-001-00-1 |
| CONTENT: | 98,9-99,99% |
| CLP CLASSIFICATION: | NA |

| | |
|---|---|
| NAME: | Nickel |
| IDENTIFICATION NOS: | CAS-no: 7440-02-0 EC-no: 231-111-4 Index-no: 028-002-00-7 |
| CONTENT: | 0,05-0,75% |
| CLP CLASSIFICATION: | STOT RE 1, Skin Sens. 1, Carc. 2<br>H317, H351, H372 |

| | |
|---|---|
| NAME: | Bismuth |
| IDENTIFICATION NOS: | CAS-no: 7440-69-9 EC-no: 231-177-4 |
| CONTENT: | 0,0-0,2% |
| CLP CLASSIFICATION: | NA |

| | |
|---|---|
| NAME: | Tin |
| IDENTIFICATION NOS: | CAS-no: 7440-31-5 EC-no: 231-141-8 |
| CONTENT: | 0,0-0,05% |
| CLP CLASSIFICATION: | NA |

(*) See full text of H-phrases in chapter 16. Occupational exposure limits are listed in section 8, if these are available.

**Other informations**

## SECTION 4: First Aid Measures

### 4.1. Description of first aid measures

**General information**

Zinc in massive form is not hazardous. During production and use the following hazardous derivates may be formed:
Respirable zinc-bearing particles and soluble zinc compounds.
General advice: Get medical attention if any discomfort develops. Show this sheet to doctor.

**Inhalation**

Zinc metal is not acutely poisonous by inhalation. Large amounts of dust can cause irritation in respiratory ducts. In this case move the patient to fresh air. Get medical attention if discomfort persists. Welding and galvanizing (temperature >930°C) combined with poor industrial hygiene practice can expose to metal fume fever ("zinc fever") which is caused by zinc oxide fumes formed in high temperatures. Symptoms can be fever, nausea, rigor, vomiting, stomach pain, muscle pain and in some cases hallucinations or incoherence. Symptoms will pass within 24 hours causing no permanent effects. Treat symptomatically if needed: removal from exposure, bed rest, oral hydration, medication against fever (ibuprofen, salicylates).
In severe cases seek for medical attention, show this sheet to doctor.

**Skin contact**

Zinc itself is not a skin irritant. Exposure to zinc oxide can cause eczema. Use general hygiene measure for contact with material: wash with soap and warm water. In case of contact with molten product cool rapidly with water and seek immediate medical attention. Never attempt to remove molten product from skin because skin will tear easily.
Cuts or abrasions should be treated promptly with thorough cleansing.

**Eye contact**

Rinse with water for 15 minutes, consult a doctor if pain persists. Do not rub eyes. Remove any contact lenses. If the patient gets tile or splashes of melted metal in the eye, the patient must be taken to a doctor immediately.

**Ingestion**

Not a normal route of entry. Zinc is an essential nutrient.In case of significant oral intake rinse mouth and give water to drink if the patient is conscious. Do not induce vomiting. Seek medical attention in case of any discomfort

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

Metal fume fever (Zinc fever): fever, nausea, rigor, vomiting, stomach pain, muscle pain and in some cases hallucinations or incoherence Ingestion (acute): nausea, vomiting, lack of appetite, stomach pain, diarrhea, headache Ingestion (chronic): Ingesting doses of zinc >100 mg/day for prolonged periods interferes with copper metabolism causind low blood copper levels, RBC microctosis and impaired immunity. Larger doses (200-800 mg/day) ingested for prolonged periods can cause anorexia, vomiting and diarrhea.

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

Supportive care and removal from source is usually adequate treatment for zinc toxicosis. In case of severe metal fume fever ("zinc fever") intravenous steroid or inhalated bronchodilatators (for wheezing) might be required. Oxygen therapy in case of hypoxemia.

**Information to medics**

Bring this safety data sheet.

## SECTION 5: Firefighting Measures

### 5.1. Extinguishing media

Material is not flammable. Recommended: alcohol-resistant foam, carbonic acid, powder, water mist.
Water jets should not be used, since they can spread the fire.
Never use water in presence of molten metal. Water expands explosively in contact with molten / liquid metal.

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

Respirable dust.

### 5.3. Advice for fire fighters

Wear self-contained breathing apparatus and protective clothing to prevent contact.
Prevent the water/foam from extinguishing the fire to reach ground water, waterways, water catchment, surface water, conduit, or water treatment plant.

## SECTION 6: Accidental Release Measures

Zinc in massive form is not hazardous. During production and some uses hazardous material (e g zinc-containing respirable particles and soluble compounds) may be formed and accidental release of these is considered.

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

Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material.
Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate.
Put on appropriate personal protective equipment (see Ch. 8).

### 6.2. Environmental precautions

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### 6.3. Methods and materials for containment and clearing up

In case of molten material: Allow to solidify before cleaning. Move containers from spill area. Vacuum or sweep up material and place in a designated, labelled waste container. Avoid creating dusty conditions.

### 6.4. References to other sections

See section on “Disposal considerations ” with regard to the handling of waste.
See section on 'Exposure controls/personal protection' for protective measures.

## SECTION 7: Handling and Storage

### 7.1. Precautions for safe handling

See section on 'Exposure controls/personal protection' for information on personal protection.
Zinc is not classified in massive forms and no protective measures are needed for safe handling.
Zinc ingots must not be allowed to get wet or damp, or be smeared with other substances, quality and identification marks must not be damaged and ingots must not be allowed to move during transportation.

Zinc ingots may contain water or moisture in hair cracks or hollows. To prevent splashes of molten metal or explosion, ingots must be carefully dried before being fed into the smelter. Persons working in the smelting process and at work stations in the immediate vicinity should use appropriate protective clothing. In case of smoke from melted product: Avoid inhalation. Avoid dust formation.

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

Always store in containers of the same material as the original.
Zinc ingots must be stored in a clean, dry, well-ventilated space so that they do not become smeared with other substances and are not contaminated by water. Storage in close proximity to acids, alkalis or oxidants should be avoided. Avoid storing with acids, bases and oxidizers. Finely pulverized substance mixed with air may cause dust explosion.

**Storage temperature**

No data available.

### 7.3. Specific end uses(s)

This product should only be used for applications described in Section 1.2.

## SECTION 8. Exposure Controls/Personal Protection

### 8.1. Control parameters

**OEL**

Zinc oxide, fume or respirable dust
Long-term exposure limit (8-hour TWA reference period): - ppm | 5 mg/m3
Short-term exposure limit (15-minute reference period): - ppm | 10 mg/m3

Nickel, inorganic compounds, water-insoluble (as Ni) (not Ni(CO)4)
Long-term exposure limit (8-hour TWA reference period): - ppm | 0,5 mg/m3
Short-term exposure limit (15-minute reference period): - ppm | - mg/m3

Nickel, inorganic compounds, water-soluble (as Ni) (not Ni(CO)4)
Long-term exposure limit (8-hour TWA reference period): - ppm | 0,1 mg/m3
Short-term exposure limit (15-minute reference period): - ppm | - mg/m3

**DNEL / PNEC**

DNEL (zinc): 0.83 mg Zn/kg bw/day - Exposure: Oral - Remarks: soluble Zn
DNEL (zinc): 0.83 mg Zn/kg bw/day - Exposure: Oral - Remarks: insoluble Zn
DNEL (zinc): 8.3 mg Zn/kg bw/day - Exposure: Dermal - Remarks: soluble Zn

DNEL (zinc): 83 mg Zn/kg bw/day - Exposure: Dermal - Remarks: insoluble Zn
DNEL (zinc): 1 mg Zn/m3 - Exposure: Inhalation - Remarks: soluble Zn, worker
DNEL (zinc): 5 mg Zn/m3 - Exposure: Inhalation - Remarks: insoluble Zn, worker
DNEL (zinc): 1.3 mg Zn/m3 - Exposure: Inhalation - Remarks: soluble Zn, consumer
DNEL (zinc): 2.5 mg Zn/m3 - Exposure: Inhalation - Remarks: insoluble Zn, consumer

PNEC (zinc): 21 µg/L - Exposure: Freshwater - Remarks: added value, Zn ion
PNEC (zinc): 6 µg/L - Exposure: Marine water - Remarks: added value, Zn ion
PNEC (zinc): 52 µg/L - Exposure: Sewage Treatment Plant - Remarks: Zn ion
PNEC (zinc): 118 mg/kg d.w. - Exposure: Freshwater sediment - Remarks: added value, Zn ion
PNEC (zinc): 57 mg/kg d.w. - Exposure: Marine water sediment - Remarks: added value, Zn ion
PNEC (zinc): 36 mg/kg d.w. - Exposure: Soil - Remarks: added value, Zn ion

## *8.2. Exposure controls*

Avoid raising dust. Keep away from naked flames / heat.

**General recommendations**

Observe general occupational hygiene.

**Exposure scenarios**

If there is an appendix to this safety data sheet, the indicated exposure scenarios must be complied.

**Exposure limits**

Trade users are covered by the rules of the working environment legislation on maximum concentrations for exposure. See work hygiene threshold values above.

**Appropriate technical measures**

Take ordinary precautions when using the product. Avoid inhalation of gas or dust. Process enclosure where applicable. Local exhaustion ventilation on furnaces and other work areas with potential dust generation, dust capturing and removal techniques.

**Hygiene measures**

Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.

**Measures to avoid environmental exposure**

No specific requirements.

**Individual protection measures, such as personal protective equipment**

**Generally**

Only CE-marked personal protection equipment should be used.

**Respiratory Equipment**

With normal handling no respiratory personal protection is necessary. If risk for exceedance of OEL/ DNEL use dust filter mask

Dust filter-halfmask:
P1 (efficiency 75%)
P2 (efficiency 90%)
P3 (efficiency 95%)

Dust filter – full mask:
P1 (efficiency 75%)
P2 (efficiency 90%) P3 (efficiency 97,5%)

**Skin protection**
Protective clothing. On heating: heatproof clothing, protective clothing against molten metal splash.
Protective clothing for workers exposed to heat. Safety shoes.
**Hand protection**
Wearing gloves is compulsory. On heating: insulated gloves.
**Eye protection**
Safety glasses are optional. On melting: face shield.

## SECTION 9: Physical and Chemical Properties

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

| Form | Colour | Odour | pH | Viscosity | Density (g/cm3) |
|---|---|---|---|---|---|
| Solid | Silver | None | - | - | 7,1 |

**Phase changes**

| Melting point (°C) | Boiling point (°C) | Vapour pressure (mm Hg) |
|---|---|---|
| 416 | | - |

**Data on fire and explosion hazards**

| Flashpoint (°C) | Ignition (°C) | Self ignition (°C) |
|---|---|---|
| - | - | - |

| Explosion limits (Vol %) | Oxidizing properties |
|---|---|
| - | - |

**Solubility**

| Solubility in water | n-Octanol/water coefficient |
|---|---|
| Zinc in massive form has very limited solubility | - |

### *9.2. Other information*

| Solubility in fat | Additional information |
|---|---|
| - | N/A |

## SECTION 10: Stability and Reactivity

### *10.1. Reactivity*

React with oxidants e.g. ammoniumnitrate, nitric acid, pottasium chlorate. Zinc dust liberates hydrogen gas in contact with oxygen and water. Forms ”white rust” in humid air.

### *10.2. Chemical stability*

The product is stable under the conditions, noted in the section on “Handling and storage”.

### *10.3. Possibility of hazardous reactions*

In molten state: violent to explosive reaction with water (moisture). Oxidizes slowly in moist air.

### *10.4. Conditions to avoid*

To avoid white rust on galvanized steel the new pieces of galvanized equipment should be kept dry and well ventilated until the surface has passivated.

### *10.5. Incompatible materials*

Strong acids, strong bases, strong oxidizing agents, and strong reductants agents.

### *10.6. Hazardous decomposition products*

The product is not degraded when used as specified in section 1. Reacts with some acids forming hydrogen.On burning: zinc oxide fumes.

## SECTION 11: Toxicological Information

### *11.1. Information on toxicological effects*

**Acute toxicity**

| Substance | Species | Test | Route of exposure | Result |
|---|---|---|---|---|
| Nickel | Rat | LD50 | Oral | >5000 mg/kg body weight |
| Zinc | Rat | LC50 | Inhalation | >5.4 mg/L/4h |
| Zinc | Rat | LD50 | Oral | >2000 mg/kg |

**Skin corrosion/irritation**

Data on substance: zinc

Result: Not irritant

**Serious eye damage/irritation**

Data on substance: zinc

Result: Not irritant

**Respiratory or skin sensitisation**

Data on substance: zinc

Result: Not sensitizing

Data on substance: nickel

Result: sensitizing

**Germ cell mutagenicity**

Data on substance: zinc

No adverse effect observed.

**Carcinogenicity**

Data on substance: zinc

No adverse effect observed.

**Reproductive toxicity**

Data on substance: zinc

No adverse effect observed.

**STOT-single exposure**

Data on substance: zinc

Result: No evidence

**STOT-repeated exposure**

Data on substance: zinc

Result: No evidence

**Aspiration hazard**
No data available.
**Long term effects**
Carcinogenic effects: This product contains substances which are considered or proven to be carcinogenic.
The danger may lie in inhalation, skin contact or ingestion.
This product contains substances that may cause an allergic reaction in people who are already so disposed

## SECTION 12: Ecological Information

### *12.1. Toxicity*

| Substance | Species | Test | Test duration | Result |
|---|---|---|---|---|
| Nickel | Fish | LC50 | 96h | >100 mg/l |
| Nickel | Daphnia | EC50 | 48h | >100 mg/l |
| Nickel | Algae | IC50 | 72h | 0.18 mg/l |
| Zinc | Daphnia | EC50 | 48 h | 0.413 mg Zn++/l, pH <7 |
| Zinc | Algae | EC50 | 72 h | 0.136 mg Zn++/l, pH >7-8.5 |
| Zinc | Daphnia | EC50 | 48 h | 11.5 mg Zn/l, pH <7 |
| Zinc | Algae | EC50 | 72 h | 15.1 mg Zn/l, pH >7-8.5 |

### *12.2. Persistence and degradability*

| Substance | Biodegradability | Test | Result |
|---|---|---|---|
| Zinc | not applicable | No data available | No data available |

### *12.3. Bioaccumulative potential*

| Substance | Potential bioaccumulation | LogPow | BFC |
|---|---|---|---|
| Zinc | No | No data available | No data available |

### *12.4. Mobility in soil*

In the CSR a solids-water partitioning coefficient of 158,5 kl/l (log value 2,2) was applied for zinc in soils (CSR zinc 2010).

### *12.5. Results of PBT and vPvB assessment*

The PBT and vPvB criteria do not apply to inorganic substances.

### *12.6. Other adverse effects*

No special.

## SECTION 13: Disposal Considerations

### *13.1. Waste treatment methods*

The product is covered by the regulations on dangerous waste.

**Waste**

EWC code
(EWC)
10 03 15, 10 05 10, 10 08 10, 10 05 03, 10 05 05, 10 05 06, 10 05 08, 10 05 10, 11 02 02, 06 04 05, 16 08 02, 17 04 04, 19 12 03

**Specific labelling**

-

**Contaminated packing**

Packaging which contains leftovers from the product must be disposed of in the same way as the product.

## SECTION 14: Transport Information

Not listed as dangerous goods under ADR and IMDG regulations.

### *14.1. – 14.4.*

**ADR/RID**

### *14.1. UN number*

### *14.2. UN proper shipping name*

### *14.3. Transport hazard class(es)*

### *14.4. Packing group*

**Notes**

**Tunnel restriction code**

**IMDG**

**UN-no.**
**Proper Shipping Name**
**Class**
**PG***
**EmS**
**MP****
**Hazardous constituent**

**IATA/ICAO**

**UN-no.**
**Proper Shipping Name**
**Class PG***

### *14.5. Environmental hazards*

-

### *14.6. Special precautions for user*

-

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

No data available.

(*) Packing group
(**) Marine pollutant

## SECTION 15: Regulatory Information

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

**Restrictions for application**

-

**Demands for specific education**

-

**Additional information**

-

**Sources**

EC regulation 1907/2006 (REACH)
Directive 2000/532/EC
EC Regulation 1272/2008 (CLP)
EH40/2005

### *15.2. Chemical Safety Assessment*

No

## SECTION 16: Other Information

**Full text of H-phrases as mentioned in section 3**

H317 - May cause an allergic skin reaction.
H351 - Suspected of causing cancer.
H372 - Causes damage to organs through prolonged or repeated exposure.

**The full text of identified uses as mentioned in section 1**

-

**Other symbols mentioned in section 2**

-

**Other**

It is recommended to hand over this safety data sheet to the actual user of the product.
Information in this safety data sheet cannot be used as a product specification.
The information in this safety data sheet applies only to this specific product (mentioned in section 1)
and is not necessarily correct for use with other chemicals/products.
A change (in proportion to the last essential change (first cipher in SDS version)) is marked with a blue triangle

**Revision information:**

Version 1
In all sections.