iBVD

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5566815519-00123
Version
1

Skapad
2021-08-12
Publicerad
2021-08-12

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

Övriga upplysningar

Klassificeringar

ETIM ›	
BK04 ›	
BSAB ›	
UNSPSC ›	

Leverantörsuppgifter

Företagsnamn
OBO Bettermann AB

Organisationsnummer
5566815519

Adress

Hemsida
www.obobettermann.se

Miljökontaktperson

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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	1,0101 - 6,2886 kg

Vara / Delkomponenter

Koncentrationen har beräknats på komponentnivå

Steel - 91% - 94% 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%			91 - 94%	

Galvanizing mixture - 6% - 9% 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 - 2,997%	
Fine zinc-nickel 0.5% nickel	33,3%			1,998 - 2,997%	
SECONDARY ZINC R1	16,7%			1,002 - 1,503%	
SECONDARY ZINC R2	16,7%			1,002 - 1,503%	

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

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
14 030 53	2046593	4012195782148
14 030 54	2046594	4012195782155
14 030 55	2046595	4012195782162
14 030 56	2046596	4012195782209
14 030 57	2046597	4012195782216
14 030 58	2046598	4012195782223
14 030 59	2046599	4012195782261

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

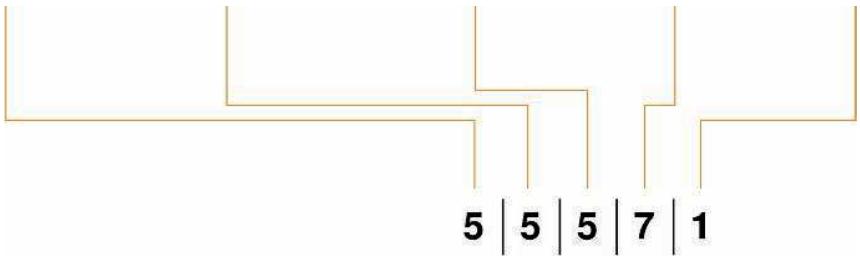
Second digit
Impact resistance

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) • Electrogalvanised (G) • Strip galvanised (FS)
3	Medium protection inside, high protection outside	
4	High protection, inside and outside	• Hot-dip galvanised (FT) • 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

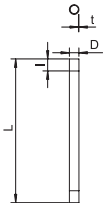
Accessories

- Wide range of application options

Quick pipe

- Innovative system
- VDE-tested
- Reclosable

Electrogalvanised steel pipe, with thread



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M E30 E90

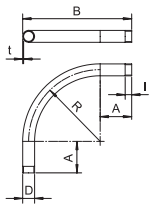
Type	Thread	Dimension D mm	Dimension L mm	Dimension l mm	Dimension t mm	Pack. m	Weight kg/100 m	Item No.
SM16W G	M16x1,5	16	3000	13	1.3	30	50.390	**2046861**
SM20W G	M20x1,5	20	3000	13	1.5	30	66.667	**2046862**
SM25W G	M25x1,5	25	3000	18	1.5	30	92.290	**2046863**
SM32W G	M32x1,5	32	3000	18	1.5	21	120.000	**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

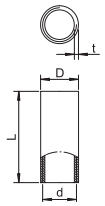
Type	Thread	Dimension A mm	Dimension B mm	Dimension D mm	Dimension l mm	Dimension R mm	Dimension t mm	Pack. pcs	Weight kg/100 pcs.	Item No.
SBNM16 G	M16x1,5	45	103	16	13	50	1.4	15	10.400	**2046778**
SBNM20 G	M20x1,5	55	155	20	13	90	1.6	25	21.000	**2046779**
SBNM25 G	M25x1,5	68	190	25	18	110	1.6	25	33.000	**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**

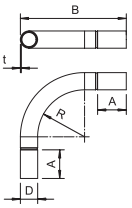
St Steel

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**

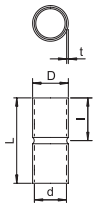
St Steel

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



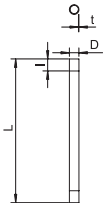
Type	Dimension D mm	Dimension d mm	Dimension L mm	Dimension l mm	Dimension t mm	Pack. pcs	Weight kg/100 pcs.	Item No.
SV16W G	18.6	16.6	50	25	1	25	2.400	**2046854**
SV20W G	23.1	20.7	60	30	1.2	50	4.000	**2046855**
SV25W G	28.1	25.7	60	30	1.2	50	5.200	**2046856**
SV32W G	35.2	32.8	70	35	1.2	50	7.200	**2046857**
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

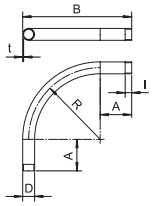
Type	Thread	Dimension D mm	Dimension L mm	Dimension l mm	Dimension t mm	Colour	Pack. m	Weight kg/100 m	Item No.
SM16W SW	M16x1,5	16	3000	13	1.3	Jet black	30	50.000	**2046500**
SM20W SW	M20x1,5	20	3000	13	1.5	Jet black	30	73.000	**2046501**
SM25W SW	M25x1,5	25	3000	18	1.5	Jet black	30	92.000	**2046502**
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

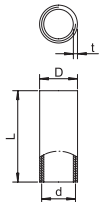
Type	Thread	Dimension B mm	Dimension D mm	Dimension R mm	Colour	Pack. pcs	Weight kg/100 pcs.	Item No.
SBNM16 SW	M16x1,5	103	16	50	Jet black	15	10.400	**2046793**
SBNM20 SW	M20x1,5	155	20	90	Jet black	25	21.000	**2046794**
SBNM25 SW	M25x1,5	190	25	110	Jet black	25	33.000	**2046795**
SBNM32 SW	M32x1,5	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**

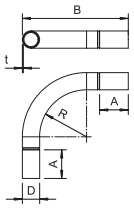
St Steel

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**

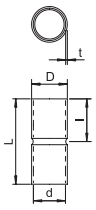
St Steel

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



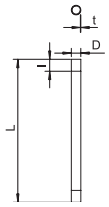
Type	Dimension D mm	Dimension d mm	Dimension L mm	Dimension l mm	Dimension t mm	Colour	Pack. pcs	Weight kg/100 pcs.	Item No.
SV16W SW	18.6	16.6	50	25	1	Jet black	25	2.400	**2046582**
SV20W SW	23.1	20.7	60	30	1.2	Jet black	50	3.200	**2046583**
SV25W SW	28.1	25.7	60	30	1.2	Jet black	50	5.200	**2046584**
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



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M E30 E90

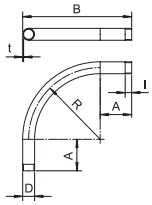
Type	Thread	Dimension D mm	Dimension L mm	Dimension l mm	Dimension t mm	Pack. m	Weight kg/100 m	Item No.
SM16W FT	M16x1,5	16	3000	13	1.3	30	54.000	**2046533**
SM20W FT	M20x1,5	20	3000	13	1.5	30	79.000	**2046534**
SM25W FT	M25x1,5	25	3000	18	1.5	30	99.000	**2046535**
SM32W FT	M32x1,5	32	3000	18	1.5	21	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

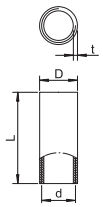
Type	Thread	Dimension A mm	Dimension B mm	Dimension D mm	Dimension l mm	Dimension R mm	Dimension t mm	Pack. pcs	Weight kg/100 pcs.	Item No.
SBNM16 FT	M16x1,5	45	103	16	13	50	1.4	15	10.400	**2046786**
SBNM20 FT	M20x1,5	55	155	20	13	90	1.6	25	21.000	**2046787**
SBNM25 FT	M25x1,5	68	190	25	18	110	1.6	25	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).

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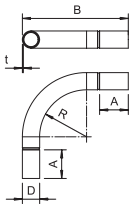
Hot-dip galvanised steel bend, without thread

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**

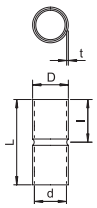
St Steel

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



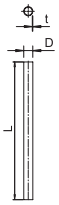
Type	Dimension D mm	Dimension d mm	Dimension L mm	Dimension l mm	Dimension t mm	Pack. pcs	Weight kg/100 pcs.	Item No.
SV16W FT	18.6	16.6	50	25	1	25	2.200	**2046620**
SV20W FT	23.1	20.7	60	30	1.2	50	3.200	**2046621**
SV25W FT	28.1	25.7	60	30	1.2	50	5.600	**2046622**
SV32W FT	35.2	32.8	70	35	1.2	50	7.800	**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



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E30 E90

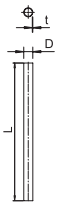
Type	Dimension D mm	Dimension L mm	Dimension t mm	Pack. m	Weight kg/100 m	Item No.
S16W A2	16	3000	1	30	37.000	**2046720**
S20W A2	20	3000	1	30	46.900	**2046721**
S25W A2	25	3000	1	30	59.200	**2046722**
S32W A2	32	3000	1.2	21	91.200	**2046723**
S40W A2	40	3000	1.2	15	114.800	**2046724**
S50W A2	50	3000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



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E30 E90

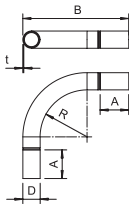
Type	Dimension D mm	Dimension L mm	Dimension t mm	Pack. m	Weight kg/100 m	Item No.
S16W A4	16	3000	1	15	37.000	**2046750**
S20W A4	20	3000	1	15	46.900	**2046751**
S25W A4	25	3000	1	15	59.200	**2046752**
S32W A4	32	3000	1.2	15	91.200	**2046753**
S40W A4	40	3000	1.2	9	114.800	**2046754**
S50W A4	50	3000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

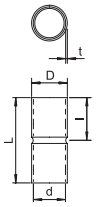
V4A Stainless steel, A4

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

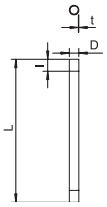


Type	Dimension D mm	Dimension d mm	Dimension L mm	Dimension l mm	Dimension t mm	Pack. pcs	Weight kg/100 pcs.	Item No.
SV16W A4	18.2	16.2	50	25	1	10	2.100	**2046770**
SV20W A4	22.2	20.2	60	30	1	15	3.200	**2046771**
SV25W A4	27.2	25.2	60	30	1	15	3.900	**2046772**
SV32W A4	34.7	32.2	70	35	1.25	15	7.300	**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



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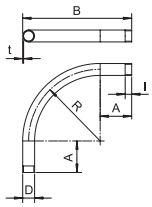
M

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



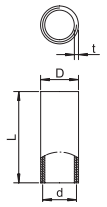
M

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

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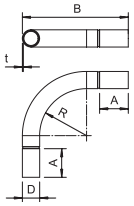
Electrical installation pipe without threaded ends to EN 61386-1 for mechanical protection of cables. With burr-free inner wall.

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

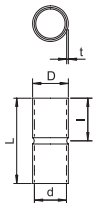


90° bend with moulded sleeves, for electrical installation pipes according to EN 61386-1. With burr-free inner wall.

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	7440-66-6 231-175-3	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 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 CAS: 7440-66-6 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 EC no. : 231-100-4	<= 30.0 ppm		Lead can be as high as 1.5 % 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) 15 (dust; total) 5 (dust; respirable)		OSHA (1989) (legal limit values)
The Netherlands / Belgium	5 (fumes)		SZW (1997) / ARAB 1999
Germany	5 (fumes) 6 (dust)		DFG (1997)
UK	5 (fumes) 10 (dust)		HSE (1998)
Sweden	5 (fumes)		National Board of Occupational Safety and Health, Sweden (1993)
Denmark	4 (fumes) 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. 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. 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. 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 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; 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

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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 CAS: 7440-66-6 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 EC no. : 231-100-4	<= 30.0 ppm		Lead can be as high as 1.5 % 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) 15 (dust; total) 5 (dust; respirable)		OSHA (1989) (legal limit values)
The Netherlands / Belgium	5 (fumes)		SZW (1997) / ARAB 1999
Germany	5 (fumes) 6 (dust)		DFG (1997)
UK	5 (fumes) 10 (dust)		HSE (1998)
Sweden	5 (fumes)		National Board of Occupational Safety and Health, Sweden (1993)
Denmark	4 (fumes) 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. 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. 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. 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 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; 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

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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 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.