

**RUBRIEK 1: Identificatie van de stof of het mengsel en van de vennootschap/onderneming****1.1 Productidentificatie****Handelsnaam:**

010501 ZINC OXIDE RAC
010503 ZINC OXIDE AC 100
010511 ZINC OXIDE RAC 25
010512 ZINC OXIDE RAC fine
010514 ZINC OXIDE RAC S
010530 ZINC OXIDE AC
011801 ZINC OXIDE SPEZIAL
011806 ZINC OXIDE WHITE SEAL
011807 ZINC OXIDE PHARMA
011812 ZINC OXIDE WHITE SEAL S extra fine
011813 ZINC OXIDE GREEN SEAL
011815 ZINC OXIDE AC 45

ZINC OXIDE**CAS-nummer:**

1314-13-2

EC-nummer:

215-222-5

Catalogusnummer:

030-013-00-7

Registratienummer 01-2119463881-32**1.2 Relevant geïdentificeerd gebruik van de stof of het mengsel en ontraden gebruik****Gebruikssector**

- SU0 Overige
- SU1 Landbouw, bosbouw en visserij
- SU3 Industrieel gebruik: Gebruik van stoffen als zodanig of in preparaten in een industriële omgeving
- SU4 Vervaardiging van voedingsmiddelen
- SU5 Vervaardiging van textiel, leer en bont
- SU6b Vervaardiging van pulp, papier en papierwaren
- SU7 Drukken en reproduceren van opgenomen media
- SU8 Vervaardiging van chemische stoffen op grote schaal (waaronder geraffineerde aardolieproducten)
- SU9 Vervaardiging van fijnere chemische stoffen
- SU10 Formuleren [mengen] van preparaten en/of ompakken (geen legeringen)
- SU11 Vervaardiging van producten van rubber
- SU12 Vervaardiging van producten van kunststof, ondermeer door samenstelling of omvorming
- SU13 Vervaardiging van andere niet-metaalhoudende minerale producten, waaronder gips en cement
- SU14 Vervaardiging van metalen in primaire vorm, inclusief legeringen
- SU15 Vervaardiging van producten van metaal, exclusief machines en apparaten
- SU16 Vervaardiging van computers, elektronische en optische producten, elektrische apparatuur
- SU17 Vervaardiging van machines, apparaten, voertuigen en andere transportmiddelen voor algemeen gebruik
- SU18 Vervaardiging van meubelen
- SU19 Bouwnijverheid
- SU20 Gezondheidszorg
- SU22 Professioneel gebruik: Publiek domein (administratie, onderwijs, amusement, dienstverlening, ambachtslieden)
- SU24 Wetenschappelijk onderzoek en ontwikkeling
- SU6a Vervaardiging van hout en houtproducten

Productcategorie

- PC1 Kleefmiddelen, afdichtingsmiddelen
- PC2 Adsorptiemiddelen
- PC4 Antivries- en ontdooimiddelen
- PC7 Basismetalen en legeringen

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(Vervolg van blz. 1)

- PC8 Biociden
- PC9a Coatings en verven, verdunners, verfabijtmiddelen
- PC9b Vulmiddelen, kit, gips, modelleerleklei
- PC9c Vingerverf
- PC11 Ontploffbare stoffen
- PC12 Meststoffen
- PC14 Producten voor behandeling van metalen oppervlakken
- PC15 Producten voor het behandelen van niet-metalen oppervlakken
- PC16 Warmtetransportvloeistoffen
- PC17 Hydraulische vloeistoffen
- PC18 Inkt en toners
- PC19 Tussenproducten
- PC20 Producten zoals pH-regelaars, uitvlokings-, neerslag- en neutraliseermiddelen
- PC21 Laboratoriumchemicaliën
- PC23 Producten voor het behandelen van leer
- PC28 Parfums, geurmiddelen
- PC29 Geneesmiddelen
- PC31 Glansmiddelen en wasmengsels
- PC32 Polymeerpreparaten en polymeerverbindingen
- PC33 Halfgeleiders
- PC34 Textielverstoffen en impregneerproducten
- PC35 Was- en reinigingsmiddelen (inclusief op oplosmiddelbasis)
- PC37 Chemische stoffen voor de waterzuivering
- PC39 Cosmetics, persoonlijke verzorgingsproducten
- PC40 Extractiemiddelen

Procescategorie

- PROC1 Chemische productie of raffinage in een gesloten proces, waarbij blootstelling niet waarschijnlijk is of processen met vergelijkbare beperkingsomstandigheden.
- PROC2 Chemische productie of raffinage in een gesloten, continu proces met incidentele beheerste blootstelling of processen met vergelijkbare beperkingsomstandigheden.
- PROC3 Fabricage of formuleren in de chemische industrie in een gesloten discontinu proces met occasionele gecontroleerde blootstelling of processen met vergelijkbare beperkingsomstandigheden.
- PROC4 Chemische productie met kans op blootstelling
- PROC5 Mengen in discontinue processen
- PROC6 Kalandereerbewerkingen
- PROC7 Spuiten in een industriële omgeving
- PROC8a Overbrengen van een stof of mengsel (vullen/leeg laten lopen in niet-gespecialiseerde voorzieningen)
- PROC8b Overbrengen van een stof of mengsel (vullen/leeg laten lopen in gespecialiseerde voorzieningen)
- PROC9 Overbrengen van een stof of mengsel naar kleine containers (gespecialiseerde vullijn, inclusief wegen)
- PROC10 Met roller of kwast aanbrengen
- PROC11 Spuiten buiten industriële omgevingen
- PROC12 Gebruik van blaasmiddelen bij de vervaardiging van schuim
- PROC13 Behandeling van voorwerpen door onderdompelen en overgieten
- PROC14 Tabletteren, comprimeren, extruderen, pelletiseren, granuleren
- PROC15 Gebruik als laboratoriumreagens
- PROC17 Smeren onder hoogenergetische omstandigheden bij metaalbewerking
- PROC19 Handmatig mengen
- PROC20 Gebruik van functionele vloeistoffen in kleine apparaten
- PROC21 Laagenergetische bewerking van in materialen en/of voorwerpen verbonden stoffen
- PROC22 Fabricage en verwerken van mineralen en/of metalen bij hogere temperaturen
- PROC24 Hoogenergetische (mechanische) veredeling van in materialen en/of voorwerpen verbonden stoffen
- PROC26 Verwerking van vaste anorganische stoffen bij omgevingstemperatuur

Milieu-emissie categorie

- ERC1 Fabricage van de stof

(Vervolg op blz. 3)

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(Vervolg van blz. 2)

- ERC2 Formuleren in een mengsel
- ERC3 Formuleren in een vaste matrix
- ERC4 Gebruik van niet-reactief verwerkingshulpmiddel op industriële locatie (geen opname in of op voorwerp)
- ERC5 Gebruik op industriële locatie leidend tot opname in of op voorwerp
- ERC6a Gebruik van tussenproduct
- ERC6b Gebruik van reactief verwerkingshulpmiddel op industriële locatie (geen opname in of op voorwerp)
- ERC6d Gebruik van reactieve procesregulator in polymerisatieprocessen op industriële locatie (al dan niet opname in of op voorwerp)
- ERC7 Gebruik van functionele vloeistoffen op industriële locatie
- ERC8a wijdverbreid gebruik van niet-reactief verwerkingshulpmiddel (geen opname in of op voorwerp, binnen)
- ERC8b wijdverbreid gebruik van reactief verwerkingshulpmiddel (geen opname in of op voorwerp, binnen)
- ERC8c wijdverbreid gebruik leidend tot opname in of op voorwerp (binnen)
- ERC8d wijdverbreid gebruik van niet-reactief verwerkingshulpmiddel (geen opname in of op voorwerp, buiten)
- ERC8f wijdverbreid gebruik leidend tot opname in of op voorwerp (buiten)
- ERC10a wijdverbreid gebruik van voorwerpen met lage vrijgave (buiten)
- ERC10b wijdverbreid gebruik van voorwerpen met hoge of bedoelde vrijgave (buiten)
- ERC11a wijdverbreid gebruik van voorwerpen met lage vrijgave (binnen)
- ERC12a Verwerken van voorwerpen op industriële locaties met lage vrijgave

1.3 Details betreffende de verstrekker van het veiligheidsinformatieblad**Fabrikant/leverancier:**

L. Brüggemann GmbH & Co. KG

Salzstraße 131

74076 Heilbronn

Fon: +49 7131 1575-0

Fax: +49 7131 1575-25-111

E-Mail: info@brueggemann.com

Inlichtingengevende sector: ehs@brueggemann.com**1.4 Telefoonnummer voor noodgevallen:** +49 761 19240 (english language)**RUBRIEK 2: Identificatie van de gevaren****2.1 Indeling van de stof of het mengsel****Indeling overeenkomstig Verordening (EG) nr. 1272/2008**

Aquatic Acute 1 H400 Zeer giftig voor in het water levende organismen.

Aquatic Chronic 1 H410 Zeer giftig voor in het water levende organismen, met langdurige gevolgen.

2.2 Etiketteringselementen**Etikettering overeenkomstig Verordening (EG) nr. 1272/2008**

De stof product is geclassificeerd en geëtiketteerd volgens de CLP-verordening.

Gevarenpictogrammen

GHS09

Signaalwoord Waarschuwing**Gevarenaanduidingen**

H410 Zeer giftig voor in het water levende organismen, met langdurige gevolgen.

Veiligheidsaanbevelingen

P273 Voorkom lozing in het milieu.

(Vervolg op blz. 4)

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P391 Gelekte/gemorste stof opruimen.

P501 De inhoud en de verpakking verwerken volgens de plaatselijke/regionale/nationale/
internationale voorschriften.**2.3 Andere gevaren****Resultaten van PBT- en zPzB-beoordeling****PBT:**

Deze stof/dit mengsel voldoet niet aan de PBT-criteria van de REACH-verordening, annex XIII

zPzB:

Deze stof/dit mengsel voldoet niet aan de zPzB-criteria van de REACH-verordening, annex XIII

RUBRIEK 3: Samenstelling en informatie over de bestanddelen**Chemische karakterisering: Stoffen****CAS-Nr. omschrijving**

1314-13-2 zinkoxide

Registratienummer 01-2119463881-32**Identificatienummer(s)****EC-nummer:** 215-222-5**Catalogusnummer:** 030-013-00-7**RUBRIEK 4: Eerstehulpmaatregelen****4.1 Beschrijving van de eerstehulpmaatregelen****Algemene informatie:**

Zelfbescherming van de eerste helper.

Slachtoffer in open lucht brengen.

Na het inademen: Frisse lucht toedienen; bij klachten arts ontbieden.**Na huidcontact:**

Onmiddellijk met water en zeep afwassen en goed naspoelen.

Wanneer de huid geïrriteerd blijft, een dokter raadplegen.

Na oogcontact:

De ogen gedurende verscheidene minuten onder stromend water afspoelen terwijl de oogspleet geopend blijft. Bij aanhoudende klachten een dokter raadplegen.

Na inslikken:

Mond spoelen en overvloedig water drinken.

Deskundige medische behandeling inschakelen.

4.2 Belangrijkste acute en uitgestelde symptomen en effecten

Maag- en darmklachten

Misselijkheid

Hoofdpijn

Koorts

4.3 Vermelding van de vereiste onmiddellijke medische verzorging en speciale behandeling

Geen verdere relevante informatie verkrijgbaar.

RUBRIEK 5: Brandbestrijdingsmaatregelen**5.1 Blusmiddelen****Geschikte blusmiddelen:**

Brandblusmaatregelen op omgeving afstemmen.

Het produkt is niet brandbaar.

5.2 Speciale gevaren die door de stof of het mengsel worden veroorzaakt

De stof is niet ontvlambaar.

(Vervolg op blz. 5)

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(Vervolg van blz. 4)

5.3 Advies voor brandweelieden**Speciale beschermende kleding:**

Adembeschermingsapparaat dragen dat niet afhankelijk is van de omgevingslucht.
Volledig beschermende overall aantrekken.

Verdere gegevens

Het besmette bluswater afzonderlijk verzamelen, mag niet in de riolering terechtkomen.

RUBRIEK 6: Maatregelen bij het accidenteel vrijkomen van de stof of het mengsel**6.1 Persoonlijke voorzorgsmaatregelen, beschermde uitrusting en noodprocedures**

Beschermende kleding aantrekken. Niet beschermde personen op afstand houden.
Stofvorming vermijden.

6.2 Milieuvoorzorgsmaatregelen:

Niet in de riolering/het oppervlaktewater/het grondwater laten terechtkomen.
Bij indringen in afvalwater of riolering moet de bevoegde instantie gewaarschuwd worden.

6.3 Insluitings- en reinigingsmethoden en -materiaal:

Mechanisch opnemen.
In speciale tanks voor terugwinning of berging verzamelen.

6.4 Verwijzing naar andere rubrieken

Informatie inzake veilig gebruik - zie hoofdstuk 7.
Informatie inzake persoonlijke beschermingsuitrusting - zie hoofdstuk 8.
Informatie inzake berging - zie hoofdstuk 13.

RUBRIEK 7: Hantering en opslag**7.1 Voorzorgsmaatregelen voor het veilig hanteren van de stof of het mengsel**

Stofvorming vermijden.
Bij een deskundig gebruik zijn geen bijzondere maatregelen vereist.

Informatie m.b.t. brand- en ontploffingsgevaar: Geen bijzondere maatregelen noodzakelijk.

7.2 Voorwaarden voor een veilige opslag, met inbegrip van incompatibele producten**Opslag:**

Eisen ten opzichte van opslagruimte en tanks: Koel en droog bewaren in goed gesloten vaten.

Informatie m.b.t. gezamenlijke opslag: Verwijderd houden van eet- en drinkwaren.

Opslagklasse: 13

7.3 Specifiek eindgebruik Geen verdere relevante informatie verkrijgbaar.

RUBRIEK 8: Maatregelen ter beheersing van blootstelling/persoonlijke bescherming**Aanvullende gegevens m.b.t. de inrichting van technische installaties:**

Geen aanvullende gegevens. Zie 7.

8.1 Controleparameters

Bestanddelen met grenswaarden die m.b.t. de werkruimte in acht genomen moeten worden:

Vervalt.

DNEL's**1314-13-2 zinkoxide**

Dermaal syst. 83 mg/kg_{bw}/d (worker, long-term)

Inhalatief syst. 2,5 mg/m³ (consumer, long-term)

5 mg/m³ (worker, long-term)

(Vervolg op blz. 6)

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(Vervolg van blz. 5)

PNEC's**1314-13-2 zinkoxide**

Aquatic	21 µg Zn/L (Freshwater)
	6 µg Zn/L (Marine Water)
Sedimentary	118 mg Zn/kg (Freshwater)
	57 mg Zn/kg (Marine Water)
Terrestrial	35,6 mg Zn/kg (soil)

8.2 Maatregelen ter beheersing van blootstelling**Persoonlijke beschermingsvoorzieningen:****Algemene beschermings- en gezondheidsmaatregelen:**

Vóór de pauze en aan het einde van werktijd handen wassen.

Ademhalingsbescherming:

Bij korte of geringe belasting ademfiltertoestel; bij intensieve resp. langdurige expositie een van de omringende lucht onafhankelijk ademhalingstoestel gebruiken.

Filter P2

Handbescherming:

Veiligheidshandschoenen of huidbeschermingscreme



Veiligheidshandschoenen

Kies handschoenmateriaal rekening houdend met de penetratietijden, de permeatiegraden en de degradatie.

Handschoenmateriaal

Nitrilrubber

Aanbevolen materiaaldikte : $\geq 0,11$ mm

Doordringingstijd van het handschoenmateriaal

Waarde voor de permeatie: Level ≤ 8 h

De precieze penetratietijd kunt u te weten komen bij de handschoenfabrikant; houd er rekening mee.

Oogbescherming:

Nauw aansluitende veiligheidsbril

Lichaamsbescherming: Draag geschikte beschermende werkkleding

RUBRIEK 9: Fysische en chemische eigenschappen**9.1 Informatie over fysische en chemische basiseigenschappen****Algemene gegevens****Voorkomen:**

Vorm:	Poeder
Kleur:	Wit
Geur:	Reukloos

pH-waarde (100 g/l) bij 20 °C: 7 (DIN EN ISO 10523)

Smelt-/vriespunt: 1975 °C (OECD 102)

Vlampunt: Niet bruikbaar.

Ontvlambaarheid (vast, gas): De stof is niet ontvlambaar.

(Vervolg op blz. 7)



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Ontledingstemperatuur:	> 2000 °C (literature)
Zelfontbrandingstemperatuur:	Het produkt ontbrandt niet uit zichzelf.
Ontploffingseigenschappen:	Het produkt is niet ontploffingsgevaarlijk.
Relatieve dichtheid bij 20 °C	5,6 g/cm ³ (literature)
Oplosbaarheid in/mengbaarheid met Water bij 20 °C:	1,6 mg/l
Verdelingscoëfficiënt: n-octanol/water:	< -4
9.2 Overige informatie	Geen verdere relevante informatie verkrijgbaar.

RUBRIEK 10: Stabiliteit en reactiviteit**10.1 Reactiviteit** Geen verdere relevante informatie verkrijgbaar.**10.2 Chemische stabiliteit**

Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Thermische afbraak / te vermijden omstandigheden:

Geen afbraak bij gebruik volgens voorschrift.

10.3 Mogelijke gevaarlijke reacties Reacties met sterke zuren en alkaliën.**10.4 Te vermijden omstandigheden**

Vormt geen specifiek gevaar indien het product in overeenstemming met de gebruikelijke regels van veiligheid en industriële hygiëne wordt gehanteerd, dit ter voorkoming van inademing van stofdeeltjes.

10.5 Chemisch op elkaar inwerkende materialen: Aluminium, Magnesium**10.6 Gevaarlijke ontledingsproducten:** Geen gevaarlijke ontbindingsproducten bekend.**RUBRIEK 11: Toxicologische informatie****11.1 Informatie over toxicologische effecten****Acute toxiciteit****1314-13-2 zinkoxide**Oraal LD₅₀ >5.000 mg/kg (rat) (OECD 401)Dermaal LD₅₀ >2.000 mg/kg (rat) (read across; ZnSO₄)Inhalatief LC₅₀/4h >5,7 mg/l (rat) (OECD 403)

Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.

Primaire aandoening:**Huidcorrosie/-irritatie**

Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.

Ernstig oogletsel/oogirritatie Geen prikkelend effect.**Sensibilisatie van de luchtwegen/de huid** Not sensitizing (Guinea pig, OECD 406, IUCLID)**Subacute tot chronische toxiciteit:****1314-13-2 zinkoxide**Oraal NOAEL (90d) 104 mg/kg_{bw}/d (mouse) (OECD 408, ZnSO₄)53,5 mg/kg_{bw}/d (rat) (OECD 408, ZnSO₄)Inhalatief NOAEL (5d) 2,7 mg/m³ (guinea pig)**CMR-effecten (kankerverwekkendheid, mutageniteit en giftigheid voor de voortplanting)****Mutageniteit in geslachtscellen**

Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.

Kankerverwekkendheid

Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.

(Vervolg op blz. 8)

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(Vervolg van blz. 7)

Giftigheid voor de voortplanting

Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.

STOT bij eenmalige blootstelling

Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.

STOT bij herhaalde blootstelling

Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.

Gevaar bij inademing

Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.

RUBRIEK 12: Ecologische informatie**12.1 Toxiciteit****Aquatische toxiciteit:****1314-13-2 zinkoxide**IC₅₀ 136 mg/l (selenastrum capricornutum) (72h, OECD 201 (ZnO))EC₅₀ 0,41 mg/l (ceriodaphnia dubia) (48 h, EPA 821 R-02-012 (Zn))LC₅₀ 0,17 mg/l (oncorhynchus mykiss) (96h, ASTM E-729-88 (ZnCl₂))NOEC 0,07 mg/L (daphnia magna) (21d, OECD 211 (ZnCl₂))0,04 mg/L (oncorhynchus mykiss) (30d, OECD 215 (ZnCl₂))

0,011 mg/L (Pseudokirchnerella subcapitata) (5d, OECD 201 (calculation method))

12.2 Persistentie en afbreekbaarheid niet toepasselijk**Eliminatiegraad:****Indeling:** note: inorganic product**12.3 Bioaccumulatie** Geen verdere relevante informatie verkrijgbaar.**12.4 Mobiliteit in de bodem** Geen verdere relevante informatie verkrijgbaar.**Verdere ecologische informatie:****Algemene informatie:**

Waterbezwaarlijkheid (NL): A(1) zeer vergiftig voor in water levende organismen kan in aquatische milieu op lange termijn schadelijke effecten veroorzaken

12.5 Resultaten van PBT- en zPzB-beoordeling**PBT:**

Deze stof/dit mengsel voldoet niet aan de PBT-criteria van de REACH-verordening, annex XIII

zPzB:

Deze stof/dit mengsel voldoet niet aan de zPzB-criteria van de REACH-verordening, annex XIII

12.6 Andere schadelijke effecten Geen verdere relevante informatie verkrijgbaar.**RUBRIEK 13: Instructies voor verwijdering****13.1 Afvalverwerkingsmethoden****Aanbeveling:**

Mag niet tesamen met huisvuil gestort worden of in de riolering terechtkomen.

Afvalverwijdering volgens overheidsbepalingen.

Niet gereinigde verpakkingen:**Aanbeveling:**

Afvalverwijdering volgens overheidsbepalingen.

Besmette verpakkingen moeten optimaal leeggemaakt worden; ze kunnen vervolgens na adequate reiniging opnieuw gebruikt worden.

RUBRIEK 14: Informatie met betrekking tot het vervoer**14.1 VN-nummer****ADR, IMDG, IATA**

UN3077

(Vervolg op blz. 9)



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14.2 Juiste ladingnaam overeenkomstig de modelreglementen van de VN

ADR	3077 MILIEUGEVAARLIJKE VASTE STOF, N.E.G. (zinkoxide)
IMDG	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc oxide), MARINE POLLUTANT
IATA	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc oxide)

14.3 Transportgevaarlijkheidsklasse(n)**ADR, IMDG, IATA**

Klasse	9 Diverse gevaarlijke stoffen en voorwerpen
Etiket	9

ADN**ADN/R-klasse:** 9**14.4 Verpakkingsgroep:****ADR, IMDG, IATA** III**14.5 Milieugevaren:****Marine pollutant:** Symbool (vis en boom)**Bijzondere kenmerking (ADR):** Symbool (vis en boom)**Bijzondere kenmerking (IATA):** Symbool (vis en boom)**14.6 Bijzondere voorzorgen voor de gebruiker**

Waarschuwing: Diverse gevaarlijke stoffen en voorwerpen

Kemler-getal: 90**EMS-nummer:** F-A,S-F**Stowage Category** A**Stowage Code** SW23 When transported in BK3 bulk container, see 7.6.2.12 and 7.7.3.9.**14.7 Vervoer in bulk overeenkomstig bijlage II bij Marpol en de IBC-code**

Niet bruikbaar.

Transport/verdere gegevens:**ADR****Beperkte hoeveelheden (LQ)** 5 kg**Uitgezonderde hoeveelheden (EQ)** Code: E1

Grootste netto hoeveelheid per

binnenverpakking: 30 g

Grootste netto hoeveelheid per

buitenverpakking: 1000 g

Vervoerscategorie 3**IMDG****Limited quantities (LQ)** 5 kg**Excepted quantities (EQ)** Code: E1

Maximum net quantity per inner packaging: 30 g

Maximum net quantity per outer packaging:

1000 g

VN "Model Regulation":

UN 3077 MILIEUGEVAARLIJKE VASTE STOF, N.E.G. (ZINKOXIDE), 9, III

NL

(Vervolg op blz. 10)

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RUBRIEK 15: Regelgeving**15.1 Specifieke veiligheids-, gezondheids- en milieureglementen en -wetgeving voor de stof of het mengsel**

Ozone layer depleting substances: Not subject to Regulation (EC) No 1005/2009.

Persistent organic pollutants (POPs): Not subject to Regulation (EC) No 850/2004.

Export and import of dangerous chemicals: Not subject to Regulation (EC) No 649/2012.

Detergents Regulation: Not subject to Regulation (EC) No 648/2004

Restrictions (REACH, Title VIII), SVHC: No restrictions according to Title VIII of Regulation (EC) No 1907/2006.

SVHC status: negative

Regulation (EC) No 1223/2009 entry 144 of Annex IV:

Zinc oxide is not to be used in applications that may lead to exposure of the end-user's lungs by inhalation.

SZW-lijst van kankerverwekkende stoffen

De stof is niet aanwezig.

SZW-lijst van mutagene stoffen

De stof is niet aanwezig.

NIET-limitatieve lijst van voor de voortplanting giftige stoffen - Vruchtbaarheid

De stof is niet aanwezig.

NIET-limitatieve lijst van voor de voortplanting giftige stoffen - Ontwikkeling

De stof is niet aanwezig.

NIET-limitatieve lijst van voor de voortplanting giftige stoffen - Borstvoeding

De stof is niet aanwezig.

Richtlijn 2012/18/EU**Gevaarlijke stoffen die met naam genoemd worden - BIJLAGE I** De stof is niet aanwezig.**Seveso-categorie E1** Gevaar voor het aquatisch milieu**Drempelwaarde (ton) voor toepassing van voorschriften voor lagedrempelinrichtingen**

100 t

Drempelwaarde (ton) voor toepassing van voorschriften voor hogedrempelinrichtingen

200 t

Nationale voorschriften:**Aanwijzingen m.b.t. tewerkstellingsbeperking:**

Tewerkstellingsbeperkingen voor de jongeren respecteren.

Gevaarklasse v. water:

Waterbezwaarlijkheid (NL): A(1) zeer vergiftig voor in water levende organismen kan in aquatische milieu op lange termijn schadelijke effecten veroorzaken

15.2 Chemische veiligheidsbeoordeling: Een chemische veiligheidsbeoordeling is uitgevoerd.**RUBRIEK 16: Overige informatie**

Deze gegevens zijn gebaseerd op de huidige stand van onze kennis. Zij beschrijven echter geen garantie van producteigenschappen en vestigen geen contractuele rechtsbetrekking.

Afkortingen en acroniemen:

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organisation

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

DNEL: Derived No-Effect Level (REACH)

PNEC: Predicted No-Effect Concentration (REACH)

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

(Vervolg op blz. 11)



datum van de druk: 24.08.2018

versie 8

Herziening van: 24.08.2018

Handelsnaam: ZINC OXIDE

Aquatic Acute 1: Gevaar voor het aquatisch milieu - acuut aquatisch gevaar – Categorie 1

Aquatic Chronic 1: Gevaar voor het aquatisch milieu - aquatisch gevaar op lange termijn – Categorie 1

(Vervolg van blz. 10)

Bronnen D'Ans Lax, Taschenbuch für Chemiker und Physiker, Springer-Verlag 1998, 4th edition

*** Gegevens die ten opzichte van de voorgaande versie zijn veranderd**

NL

EXPOSURE SCENARIOS

Introduction to (short) Generic Exposure Scenarios (GES): ZnO

For assessment of exposures at local scale, several generic exposure scenarios (GES) were developed in the chemical safety report (CSR) for each zinc substance. This was necessary because of the significant number of uses that was identified for each of the substances. The multitude of identified uses was assigned to the respective GES based on similarity of process, and , consequently, similarity in exposure and risk management measures. So, GES are relevant for the different identified uses that they group at the same time.

Approaches for local exposure assessment

- Assessment of workers exposure is related to the place /process the worker is involved in. The GES group different processes; exposure assessment is done using the worst case approach by considering full shift exposure at the workplace with highest potential for exposure. Risk management measures are specified accordingly.
- Environmental emissions (notably to water) are usually integrating the totality of emissions from a given site, and cannot be distinguished for each process. Therefore assessments in the GES are done for the site as a whole.

Shortened GES for annexing to the e-SDS

For reasons of clarity, shortened versions of the GES as documented in the CSR have been listed below. These shortened versions focus on a) operational conditions and b) risk management measures. Repetition of information contained in the SDS has been avoided by cross-referencing.

How to identify the GES related to a given use?

In table below, the generic exposure scenarios (GES) developed for ZnO are presented.

Table : Generic exposure scenarios (GES) for ZnO (ref : CSR zinc oxide, version Nov 2010)

Number	Sector	Uses	Code
0	Zinc oxide production	Manufacture Substance	GES _{ZnO} 0
1	Formulation step	Formulation general	GES _{ZnO} 1
2	First tier applications	Manufacturing of other zinc compounds	GES _{ZnO} 2
3		Laboratory reagent	GES _{ZnO} 3
4		As component for solid blends & matrices	GES _{ZnO} 4
5		As component for production of dispersions, pastes and other viscous matrices	GES _{ZnO} 5
6	Second tier applications	DU of ZnO-containing solid preparations	GES _{ZnO} 6
7		DU of ZnO-containing liquid & pasty preparations	GES _{ZnO} 7

ZINC OXIDE

Revision date: 27/02/2015

Version: 4.0

To facilitate the identification of the GES related to a given downstream use, the table below lists the different uses that were identified for ZnO. In this table, the downstream user can look up its use(s) and find the corresponding GES for attachment to his e-SDS.

Table: Identified uses for ZnO and corresponding Generic Exposure Scenario (GES) (ref: CSR zinc oxide, version Nov 2010)

IU number	Identified Use (IU) name	GES code
1	Zinc oxide production-Direct	GESZnO 0
2	Zinc oxide production-Indirect	GESZnO 0
3	Zinc oxide production-Wet	GESZnO 0
9	Component for production of inorganic zinc compounds	GESZnO 2
10	Electrogalvanizing	GESZnO 2
11	Electroplating	GESZnO 2
12	Zinc production by electrowinning	GESZnO 2
13	Laboratory reagent	GESZnO 3
14	Zinc production by pyrometallurgy	GESZnO 2
15	Zinc oxide production & refining	GESZnO 0
16	Component for production of organic zinc compounds	GESZnO 2
17	Component for production of Inorganic pigments	GESZnO 1, GESZnO 4
18	Component for production of Coatings / paints, inks, enamels, varnishes	GESZnO 1, GESZnO 4
19	Use of ZnO-containing paints & coatings	GESZnO 7
20	Artists supply: Use of ZnO-containing paints & coatings	Generic consumer/environment*
21	Component for Paper coating	GESZnO 1, GESZnO 5
22	Use of ZnO-containing paper coatings	GESZnO 6
23	Component for Textile & leather coating / treatment	GESZnO 1, GESZnO 5
24	Use of ZnO-containing textile & leather coatings	GESZnO 6
25	Additive / component for production of ceramics	GESZnO 1, GESZnO 4
26	Additive /component for production of frits	GESZnO 1, GESZnO 4
27	Use of ZnO-containing glazes and glassy thin film coatings	GESZnO 6
28	Additive for the production of Friction agents	GESZnO 1, GESZnO 4
29	Use of ZnO-containing friction agents: Brake pads	GESZnO 6
30	Additive / component for production of glass	GESZnO 1, GESZnO 4
31	Surface treatment of flat glass	GESZnO 1, GESZnO 4
32	Use of ZnO-containing glass & ceramics in dinnerware	GESZnO 6
33	Use of ZnO-containing glass in displays	GESZnO 6
34	Use of ZnO-containing glassy thin film coatings	GESZnO 6
35	Additive in the manufacturing of electronic components	GESZnO 1, GESZnO 4
36	Additive in the manufacturing of ferrites	GESZnO 1, GESZnO 4
37	Additive in the manufacturing of varistors	GESZnO 1, GESZnO 4
38	ZnO in electrotechnical contact material	GESZnO 1, GESZnO 4
39	Batteries/Fuel cells	GESZnO 1, GESZnO 4, GESZnO 5

ZINC OXIDE

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Version: 4.0

IU number	Identified Use (IU) name	GES code
40	Component for production of rubber, resins and related preparations	GESZnO 1, GESZnO 5
41	Use of ZnO-containing rubber for tyres	GESZnO 7
42	Use of ZnO-containing rubber and other resins for medical devices and applications	GESZnO 7
43	Component for polymer-matrices, plastics and related preparations	GESZnO 1, GESZnO 5
44	Use of ZnO-containing polymers for floor, wall coverings and similar preparations	GESZnO 7
45	Use of ZnO-containing polymers for cable protecting & isolating coatings	GESZnO 7
46	Use of ZnO-containing polymers for tube & sheet articles	GESZnO 7
47	Use of ZnO-containing polymers for molded articles	GESZnO 7
48	Use of ZnO-containing plastic thin films coatings	Generic consumer/environment
49	Additive for the production of Sealants / Adhesives / Mastics	GESZnO 1, GESZnO 5
50	Use of ZnO-containing Sealants / Adhesives / Mastics	Generic consumer/environment
51	Additive for the production of Lubricants / Grease / Metal working fluids	GESZnO 1, GESZnO 5
52	Use of ZnO-containing Lubricants / Grease / Metal working fluids	Generic consumer/environment
53	Additive for the production of Polishes / wax blends	GESZnO 1, GESZnO 5
54	Use of ZnO-containing Polishes/ wax blends	Generic consumer/environment
55	Use of ZnO-containing catalysts	GESZnO 1, GESZnO 5
56	Use of ZnO-containing adsorbents	GESZnO 1, GESZnO 5
57	Additive for production of de-icing products	GESZnO 1, GESZnO 5
58	Use of ZnO-containing de-icing products	Generic consumer/environment
59	Additive for the production of pyrotechnic products	GESZnO 1, GESZnO 4
60	Use of ZnO-containing pyrotechnic products	Generic consumer/environment
61	Additive for the formulation of nutrition additives	GESZnO 1, GESZnO 4, GESZnO 5
62	Additive for the formulation of animal feedstuffs	GESZnO 1, GESZnO 4, GESZnO 5
63	Additive for the formulation of biocidal products	GESZnO 1, GESZnO 4, GESZnO 5
64	Use of ZnO-containing biocidal products	GESZnO 6, GESZnO 7, Generic consumer/environment
65	Additive for the formulation of cleaning products	GESZnO 1, GESZnO 4, GESZnO 5
66	Use of ZnO-containing cleaning products	GESZnO 6, GESZnO 7, Generic consumer/environment
67	Additive for the formulation of fertilizers	GESZnO 1, GESZnO 4, GESZnO 5
68	Use of ZnO-containing fertilizer's formulations	Generic consumer/environment
69	Additive in the formulation of cosmetics	GESZnO 1, GESZnO 4, GESZnO 5
70	Use of cosmetics	GESZnO 6, GESZnO 7, Generic consumer/environment
71	Additive in dentistry products	GESZnO 1, GESZnO 4, GESZnO 5
72	Additive in the formulation of pharma / veterinary products	GESZnO 1, GESZnO 4, GESZnO 5

IU number	Identified Use (IU) name	GES code
73	Use of pharma / veterinary products	GESZnO 6, GESZnO 7, Generic consumer/environment

GES ZnO-0: Industrial use of primary or secondary zinc bearing material in the manufacture of ZnO by several pyro-or hydrometallurgical processes.
SU: 3, 8, 9 PROC: 1, 2, 3, 4,5 , 8b, 9, 22, 26 PC: 19, 20 AC: not applicable ERC: 1, 6a
Description of activities and processes covered in the exposure scenario: There are 3 production processes for ZnO: <ul style="list-style-type: none"> the indirect process In this process, the starting material is zinc metal (with a purity of 92 – 99.995 %), refined metal, metallic residues and scrap. The zinc metal is melted, vaporised by boiling and oxidised in the vapour state to zinc oxide with excess of air. Afterwards, the zinc vapour is burned (oxidised) to produce zinc oxide, which is quenched in excess of air, precipitated from the ZnO/air mixture in settling chambers, in which the fractionation of the zinc oxide particles takes place according to their size. the direct process In this process, the starting material is zinc oxide containing residue. The material is blended with reducing agent (coke breeze) and fed to a furnace. At elevated temperature (~1000°C); the ZnO is reduced to Zinc which vaporises by boiling at that temperature. Air is blown above the surface and oxidises Zinc in the vapour state to Zinc oxide which is entrained in the exhaust airflow. The entrained Zinc oxide is quenched in excess of air, precipitated from that ZnO/air mixture in settling chambers, in which the fractionation of the zinc oxide particles takes place according to their size. the wet process In this process, the starting material is a purified zinc salt solution (predominantly dithionate, sulphate or chloride). Zinc hydroxide and/or carbonate are subsequently precipitated by the addition of alkalines and filtered from the solutions. Finally, zinc oxide is generated by calcination (dehydration, de-carboxylation) of the Zinc hydroxide or Zinc carbonate or a mixture of both. The resulting zinc oxide is subsequently collected in bag filters after cooling the exhaust air, and is then packed, as such in powdery form, into paper sacks or big bags, or further granulated before packaging
Contributing scenario (1) controlling environmental exposure
Product characteristics: see sections 3 (composition) & 9 (phys-chem properties) of SDS ZnO is produced in minimum 80% purity
Amounts used: maximum 50000 T/y
Frequency and duration of use: Continuous production
Environment factors not influenced by risk management: Flow rate receiving waters default for generic scenario: 18,000 m3/d, unless specified otherwise
Other given operational conditions affecting environmental exposure: <ul style="list-style-type: none"> In the wet process, most of the operations are in wet phase. In the direct and indirect dry process, all operational conditions are dry throughout the process; there are no process waters; high temperature steps; Even when no process waters (e.g. when dry process throughout), some non-process water can be generated containing zinc (e.g. from cleaning) All processes are performed indoor in a confined area. All residues containing zinc are recycled.
Technical conditions and measures at process level (source) to prevent release: See MSDS section 8
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil: See section 8 of SDS
Organizational measures to prevent/limit release from site: See section 8 of SDS
Conditions and measures related to municipal sewage treatment plant: In cases where applicable: default size of the municipal STP (2000 m3/d), unless specified otherwise.
Conditions and measures related to external treatment of waste for disposal: If any, all hazardous wastes are treated by certified contractors according to EU and national legislation.

Conditions and measures related to external recovery of waste: <ul style="list-style-type: none"> All residues from the wet process are recycled. By-products (ashes) from the dry process that are formed in the reactor are recovered and either recycled in the system or handled further according the waste legislation. Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.
Contributing scenario (2) controlling worker exposure
Product characteristics: see sections 3 (composition) & 9 (phys-chem properties) of SDS ZnO (100%) as solid (dry powder) The manufactured zinc oxide is collected in bag filters after cooling the exhaust air, and is then packed, as such in powdery form, into paper sacks or big bags, or further granulated before packaging.
Amounts used: Maximum 96 T/day, 32T/shift
Frequency and duration of use/exposure: 8hrs shift
Human factors not influenced by risk management: Uncovered body parts, (potentially) face can be exposed due to nature of activity
Other given operational conditions affecting workers exposure: All processes are carried out indoor in confined areas.
Technical conditions and measures at process level (source) to prevent release: See MSDS section 8
Technical conditions and measures to control dispersion from source towards the worker: See MSDS section 8
Organisational measures to prevent /limit releases, dispersion and exposure: See MSDS section 8
Conditions and measures related to personal protection, hygiene and health evaluation: <ul style="list-style-type: none"> Wearing of gloves and protective clothing is compulsory (efficiency $\geq 90\%$). With normal handling, no respiratory personal protection (breathing apparatus) is necessary. If risk for exceedance of OEL/DNEL, use mask as described in MSDS section 8 Eyes: safety glasses are optional

Exposure estimation and reference to its source: not relevant, refer to CSR.

Risks for workers and to the environment have to be assessed considering the PNECs and DNELs mentioned under SDS section 8

Guidance to DU to evaluate whether he works inside the boundaries set by the (G)ES.

Occupational exposure/environmental emissions

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. Detailed guidance for evaluation of ES can be acquired via your supplier or from the ECHA website (guidance R14, R16). Environmental and human exposure can be measured or modelled (more information on tools available in SDS section 8).

In addition, bioavailability corrections can be integrated in the exposure assessment, if the environmental parameters that are needed for the calculations are documented (see SDS section 8)

ZnO GES-1: Industrial use of ZnO in the formulation of preparations by mixing thoroughly, dry or in a solvent, the starting materials with potentially pressing, pelletizing, sintering, and possibly followed by packaging.
SU: 3,8,9, 10 PROC: 1,2,3,4,5, 8b,9,13, 14, 15, 22,26 PC: Not applicable AC: not applicable ERC: 1,2, 6a

<p>In the described process, the zinc oxide is:</p> <ul style="list-style-type: none"> Removed from the packaging and stored in silos after delivery. Extracted from the silo, dosed and fed with the other reagents to the mixing tank. Mixing occurs batch-wise or continuously, according the process receipt. The mixing occurs in a closed tank/chamber. The preparation (dry or wet (solvent/paste) matrix) is further used as such or packed for further treatment/use.
Contributing scenario (1) controlling environmental exposure
Product characteristics: see sections 3 (composition) & 9 (phys-chem properties) of SDS, ZnO is used in minimum 80% purity
Amounts used: maximum 5000 T/y
Frequency and duration of use Continuous production is assumed as a worst case. It is possible that use is not continuous; this has to be considered when estimating exposure.
Environment factors not influenced by risk management Flow rate receiving waters default for generic scenario: 18,000 m ³ /d, unless specified otherwise
Other given operational conditions affecting environmental exposure <ul style="list-style-type: none"> All processes are performed indoor in a confined area. High temperature steps are possible. All residues containing zinc are recycled. Even when no process waters (e.g. when dry process throughout), some non-process water can be generated containing zinc(e.g. from cleaning)
Technical conditions and measures at process level (source) to prevent release: see MSDS section 8
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil: see MSDS section 8
Organizational measures to prevent/limit release from site: see MSDS section 8
Conditions and measures related to municipal sewage treatment plant: In cases where applicable: default size of the municipal STP (2000 m ³ /d), unless specified otherwise.
Conditions and measures related to external treatment of waste for disposal: <ul style="list-style-type: none"> If any, all hazardous wastes are treated by certified contractors according to EU and national legislation. Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.
Conditions and measures related to external recovery of waste: All residues are recycled or handled and conveyed according to the waste legislation.
Contributing scenario (2) controlling worker exposure
Product characteristic: see sections 3 (composition) & 9 (phys-chem properties) of SDS The preparation can be solid or liquid. When the preparation is in solid state, it can be in a) powdery, b) glassy or c) pelletized form. In the powder form, it can be characterised by high dustiness in a worst case situation.
Amounts used: Max 5000T/y = 14T/d = 5T/shift depending on the application.
Frequency and duration of use/exposure: 8 hour shifts (default worst case) are assumed as starting point; it is emphasised that the real duration of exposure could be less. This has to be considered when estimating exposure.
Human factors not influenced by risk management: Uncovered body parts, (potentially) face can be exposed due to nature of activity
Other given operational conditions affecting workers exposure: <ul style="list-style-type: none"> high temperature steps can occur; all indoor processes in confined area.
Technical conditions and measures at process level (source) to prevent release: See MSDS section 8
Technical conditions and measures to control dispersion from source towards the worker: See MSDS section 8
Organisational measures to prevent /limit releases, dispersion and exposure: See MSDS section 8

Conditions and measures related to personal protection, hygiene and health evaluation:

- Wearing of gloves and protective clothing is compulsory (efficiency $\geq 90\%$).
- With normal handling, no respiratory personal protection (breathing apparatus) is necessary. If risk for exceedance of OEL/DNEL, use mask as described in MSDS section 8
- Eyes: safety glasses are optional

Exposure estimation and reference to its source: not relevant, refer to CSR.

Risks for workers and to the environment have to be assessed considering the PNECs and DNELs mentioned under SDS section 8

Guidance to DU to evaluate whether he works inside the boundaries set by the (G)ES.

Occupational exposure/environmental emissions

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. Detailed guidance for evaluation of ES can be acquired via your supplier or from the ECHA website (guidance R14, R16). Environmental and human exposure can be measured or modelled (more information on tools available in SDS section 8).

In addition, bioavailability corrections can be integrated in the exposure assessment, if the environmental parameters that are needed for the calculations are documented (see SDS section 8)

GES ZnO-2: industrial use of zinc oxide or ZnO-formulations in the manufacturing of other inorganic or organic zinc substances through different process routes, with potentially drying, calcining and packaging.
SU: 3, 8, 9, 10, 14, 15,17, 0 (Nace C24. 4.3., E38.3, C25. 6.1) PROC: 1, 2, 3, 4, 8b, 9, 13, 15, 21, 22, 23, 26 PC : 7, 14, 19, 20, 21 AC : 2, 7, 12 ERC : 1, 2, 4, 5, 6a, 6b, 8a, 8d
Description of activities/process(es) covered in the Exposure Scenario <ul style="list-style-type: none"> • Reception of the ZnO or ZnO-containing formulation, or ZnO-bearing raw material in the reaction tank • Sequential addition of reagents for purification steps and filtration on press filter, when needed (ventilation is adapted). • Concentration by water evaporation, under exhaust hood. • Possible pouring on a cooling belt • Discharge and packaging of produced zinc compounds. Workers have to place and adjust the bag or drum under the discharge pipe and to set the process in motion. Filled bags or drums are subsequently closed and carried to the storage area. • Exposure to dust can occur during packing of the powder. Solutions are packed in intermediate bulk containers (ca. 1 m3 capacity); solids are packed in bags or drums. • Maintenance activities
Contributing scenario (1) controlling environmental exposure
Product characteristics: see sections 3 (composition) & 9 (phys-chem properties) of SDS Zn-compounds are produced in their pure form e.g; >99%, or in solution.
Amounts used: Up to 75 T/d of ZnO is transformed to equivalent Zn compound
Frequency and duration of use: Continuous production is assumed as a worst case. It is possible that use is not continuous; this has to be considered when estimating exposure.
Environment factors not influenced by risk management Flow rate of receiving surface water usually 18,000 m3/d by default, unless specified otherwise
Other given operational conditions affecting environmental exposure <ul style="list-style-type: none"> • Wet processes (leaching, filtering, purification) followed by drying (possible grinding), and packaging; • All indoor processes, in confined area.
Technical conditions and measures at process level (source) to prevent release: see SDS section 8
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil: see SDS section 8
Organizational measures to prevent/limit release from site: see SDS section 8
Conditions and measures related to municipal sewage treatment plant: In cases where applicable: default size of the municipal STP (2000 m3/d), unless specified otherwise.
Conditions and measures related to external treatment of waste for disposal: <ul style="list-style-type: none"> • If any, all hazardous wastes are treated by certified contractors according to EU and national legislation. • Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products • Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.

Conditions and measures related to external recovery of waste: <ul style="list-style-type: none"> All residues from the wet process are recycled. Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.
Contributing scenario (2) controlling worker exposure
Product characteristic: see sections 3 (composition) & 9 (phys-chem properties) of SDS <ul style="list-style-type: none"> Zinc oxide is transformed to equivalent pure zinc compound. The formed zinc compound can be produced as a powder with varying particle size (worst case scenario) or can be in solution.
Amounts used: Up to maximum 25T/shift
Frequency and duration of use/exposure: 8hrs shift (worst case)
Human factors not influenced by risk management: Uncovered body parts, (potentially) face can be exposed due to nature of activity
Other given operational conditions affecting workers exposure: All processes are carried out indoor in confined areas.
Technical conditions and measures at process level (source) to prevent release: see section 8 of SDS
Organisational measures to prevent /limit releases, dispersion and exposure: see section 8 of SDS
Conditions and measures related to personal protection, hygiene and health evaluation: <ul style="list-style-type: none"> Wearing of gloves and protective clothing is compulsory (efficiency $\geq 90\%$) With normal handling, no respiratory personal protection (breathing apparatus) is necessary. If risk for exceedance of OEL/DNEL, use filter masks as described in section 8 of SDS Eyes: safety glasses are optional

Exposure estimation and reference to its source: not relevant, refer to CSR.

Risks for workers and to the environment have to be assessed considering the PNECs and DNELs mentioned under SDS section 8

Guidance to DU to evaluate whether he works inside the boundaries set by the (G)ES.

Occupational exposure/environmental emissions

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. Detailed guidance for evaluation of ES can be acquired via your supplier or from the ECHA website (guidance R14, R16). Environmental and human exposure can be measured or modelled (more information on tools available in SDS section 8).

In addition, bioavailability corrections can be integrated in the exposure assessment, if the environmental parameters that are needed for the calculations are documented (see SDS section 8)

GES ZnO-3: Industrial and professional use of ZnO as active laboratory reagent in aqueous or organic media, for analysis or synthesis.
SU: 3, 10, 22, 24 PROC: 1, 2, 3, 4, 5, 8b, 9, 15 PC: 19, 21, 28, 39 AC: not applicable ERC: 1,2, 4, 6a, 6b, 8a, 8b, 8d
Contributing scenario (1) controlling environmental exposure
The zinc oxide is used for: Analysis: sample (solid or liquid) treatment or preparation: the substance is in the sample or in the reagent Synthesis: manipulations are usually under ventilation (e.g. laminar flow, ventilation hood) The substance is used at the industrial scale, in industrial installations for air control and water treatment and at the professional scale by laboratories
Product characteristics: see sections 3 (composition) & 9 (phys-chem properties) of SDS

Amounts used: <ul style="list-style-type: none"> • maximum 5 T/y (industrial scale) • maximum 0.5 T/y (professional scale)
Frequency and duration of use: Use is usually intermittent but continuous use is assumed as a worst case.
Environment factors not influenced by risk management Flow rate of receiving surface water: default for generic scenario: 18,000 m ³ /d, unless specified otherwise
Other given operational conditions affecting environmental exposure All processes are performed indoor in a confined area, with dedicated laboratory equipment. All solid residues containing zinc are recovered for recycling.
Technical conditions and measures at process level (source) to prevent release: see section 8 of SDS
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil <ul style="list-style-type: none"> • Industrial scale: please refer to section 8 of SDS • At professional scale, the emissions are treated usually by STP. Professional services will be used for treating waste streams e.g. for the recovery of metallic solids (for recycling), and for the recovery of e.g. acid solutions containing the substance.
Organizational measures to prevent/limit release from site: see section 8 of SDS
Conditions and measures related to municipal sewage treatment plant: In cases where applicable: default size (2000 m ³ /d), unless specified otherwise.
Conditions and measures related to external treatment of waste for disposal: <ul style="list-style-type: none"> • If any, all hazardous wastes are treated by certified contractors according to EU and national legislation. • Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products • Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.
Conditions and measures related to external recovery of waste: All residues are recycled or handled and conveyed according to waste legislation.
Contributing scenario (2) controlling worker exposure
Product characteristic: see sections 3 (composition) & 9 (phys-chem properties) of SDS
Amounts used: <ul style="list-style-type: none"> • maximum 5 T/y (industrial scale) • maximum 0.5 T/y (professional scale)
Frequency and duration of use/exposure: Use is usually intermittent but continuous use is assumed as a worst case
Human factors not influenced by risk management: Uncovered body parts, (potentially) face can be exposed due to nature of activity
Other given operational conditions affecting workers exposure: <ul style="list-style-type: none"> • high temperature steps can occur in protected zones (fume cupboards); • all indoor processes in confined area, including hazardous substances cabinets.
Technical conditions and measures at process level (source) to prevent release: see section 8 of SDS for general measures
Technical conditions and measures to control dispersion from source towards the worker: See section 8 of SDS for general measures Local exhaust ventilation systems are provided where needed on the benches and in the fume cupboards.
Organisational measures to prevent /limit releases, dispersion and exposure: see section 8 of SDS
Conditions and measures related to personal protection, hygiene and health evaluation: see section 8 of SDS

Exposure estimation and reference to its source: not relevant, refer to CSR.

Risks for workers and to the environment have to be assessed considering the PNECs and DNELs mentioned under SDS section 8

Guidance to DU to evaluate whether he works inside the boundaries set by the (G)ES.

Occupational exposure/environmental emissions

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions

and implemented risk management measures are adequate. Detailed guidance for evaluation of ES can be acquired via your supplier or from the ECHA website (guidance R14, R16). Environmental and human exposure can be measured or modelled (more information on tools available in SDS section 8).

In addition, bioavailability corrections can be integrated in the exposure assessment, if the environmental parameters that are needed for the calculations are documented (see SDS section 8)

GES ZnO-4: Industrial use of ZnO or ZnO-formulations as component for the manufacture of solid blends and matrices for further downstream use.
SU: 1, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 16, 20, 0 (Nace C20.1.2., C20.2, C20.5.1., C23.1.1., C23.2) PROC: 1, 2, 3, 4, 5, 6, 8b, 9, 13, 14, 15, 22, 24, 26 PC: 1, 5, 7, 9a, 9b, 9c, 11, 14, 15, 17, 18, 19, 20, 21, 29, 37, (ucnF05990, E070000, 30200) AC: 2, 3, 4, 7, TARIC 6813.18, 854121) ERC: 1, 2, 3, 4, 5, 6a, 6b, 7, 8a, 8b, 8d, 10a, 10b, 11a
ZnO or ZnO-containing preparations are used in the manufacture of dry preparations by mixing thoroughly the starting materials, possibly followed by pressing or pelletizing, and finally packaging of the preparation. The ZnO (/Zn compound) containing preparation/mixture can be either <ul style="list-style-type: none"> • Pressed at high temperature (>1000°C), grinded and re-pressed/sintered or fritted at high temperature • Molten at high temperature (>500°C) and further cast as glassy material • Pressed and pelletized at low temperature And subsequently packed, or used as such, in further treatment/use
Contributing scenario (1) controlling environmental exposure
Product characteristics: see sections 3 (composition) & 9 (phys-chem properties) of SDS
Amounts used: maximum 5000 T/y
Frequency and duration of use: Continuous production is assumed as a worst case
Environment factors not influenced by risk management: Flow rate of receiving surface water default for generic scenario: 18,000 m ³ /d, unless specified otherwise
Other given operational conditions affecting environmental exposure <ul style="list-style-type: none"> • All dry processes throughout, no process waters. Even when no process waters occur (with dry process throughout), some non-process water can be generated containing zinc (e.g. from cleaning) • High temperature steps are possible. • All processes are performed indoor in a confined area. High temperature steps are possible. All residues containing zinc are recycled.
Technical conditions and measures at process level (source) to prevent release: see section 8 of SDS
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil See section 8 of SDS for general measures No process waters, so possible emissions to water are limited and non-process related.
Organizational measures to prevent/limit release from site: see section 8 of SDS
Conditions and measures related to municipal sewage treatment plant: In cases where applicable: default size STP (2000 m ³ /d), unless specified otherwise.
Conditions and measures related to external treatment of waste for disposal <ul style="list-style-type: none"> • If any, all hazardous wastes are treated by certified contractors according to EU and national legislation. • Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products • Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according to the Waste regulation.
Conditions and measures related to external recovery of waste <ul style="list-style-type: none"> • All residues are recycled or handled and conveyed according to waste legislation. • Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products • Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according to the Waste regulation.
Contributing scenario (2) controlling worker exposure

Product characteristic: see sections 3 (composition) & 9 (phys-chem properties) of SDS <ul style="list-style-type: none"> Concentration of ZnO in the mixtures can be up to >25% but is usually of the order of <= 5%, depending on the application The preparation is in the solid state, usually with a low level of dustiness; however, powder forms can occur, the high dustiness is therefore applied as a worst case
Amounts used: Max 5000T/y = 15T/d = 5T/shift depending on the application.
Frequency and duration of use/exposure: 8 hour shifts (default worst case) are assumed as starting point
Human factors not influenced by risk management Uncovered body parts, (potentially) face can be exposed due to nature of activity
Other given operational conditions affecting workers exposure <ul style="list-style-type: none"> Dry processes: dry operational conditions throughout the process; no process waters; high temperature steps can occur; indoor processes in confined area.
Technical conditions and measures at process level (source) to prevent release: see section 8 of SDS
Technical conditions and measures to control dispersion from source towards the worker: see section 8 of SDS
Organisational measures to prevent /limit releases, dispersion and exposure: see section 8 of SDS
Conditions and measures related to personal protection, hygiene and health evaluation: see section 8 of SDS (personal protection)

Exposure estimation and reference to its source: not relevant, refer to CSR.

Risks for workers and to the environment have to be assessed considering the PNECs and DNELs mentioned under SDS section 8

Guidance to DU to evaluate whether he works inside the boundaries set by the (G)ES.

Occupational exposure/environmental emissions

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. Detailed guidance for evaluation of ES can be acquired via your supplier or from the ECHA website (guidance R14, R16). Environmental and human exposure can be measured or modelled (more information on tools available in SDS section 8).

In addition, bioavailability corrections can be integrated in the exposure assessment, if the environmental parameters that are needed for the calculations are documented (see SDS section 8)

GES ZnO-5: Industrial use of ZnO or ZnO-formulations as component for the manufacture of dispersions, pastes or other viscous or polymerized matrices.
SU: 1, 3, 4, 5, 6b, 7, 8, 9, 10, 11, 12, 16, 18, 20,0 (Nace C20.2. C27.2) PROC:1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 12, 13, 14,19, 20, 21, 22, 24, 26 PC: 1, 2, 4, 7, 8, 9a, 9b, 12, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 28, 29, 31, 32, 33, 34, 35,37, 39, 40 AC: 1, 2,3,7, 10, 11, 13 ERC: 1, 2, 3, 4, 5, 6a, 6b, 6d, 7, 8a, 8b, 8c, 8d, 8f, 10a, 10b, 11a
In the described process, the zinc oxide containing preparation/mixture is: <ul style="list-style-type: none"> Unpacked and stored in silos Extracted from the silo, dosed and fed with the other reagents and/or solvents to the mixing tank, batch-wise or continuously, according the process receipt. The resulting zinc salt containing mixture (solution, dispersion, paste) is directly further processed, or packed, for further treatment/use.
Contributing scenario (1) controlling environmental exposure
Product characteristics: see sections 3 (composition) & 9 (phys-chem properties) of SDS ZnO in preparation can be > 25%, usually <5%
Amounts used: maximum 5000 T/y
Frequency and duration of use: Continuous production is assumed as a worst case.
Environment factors not influenced by risk management: Flow rate of receiving surface water default: 18,000 m3/d, unless specified otherwise

Other given operational conditions affecting environmental exposure <ul style="list-style-type: none"> • Even when no process waters occur, some non-process water can be generated containing zinc (e.g. from cleaning) • All processes are performed indoor in a confined area. • All residues containing zinc are recycled.
Technical conditions and measures at process level (source) to prevent release: see section 8 of SDS
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil: see section 8 of SDS
Organizational measures to prevent/limit release from site: see section 8 of SDS
Conditions and measures related to municipal sewage treatment plant In cases where applicable: default size of municipal STP (2000m ³ /d), unless specified otherwise.
Conditions and measures related to external treatment of waste for disposal <ul style="list-style-type: none"> • If any, all hazardous wastes are treated by certified contractors according to EU and national legislation. • Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products • Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.
Conditions and measures related to external recovery of waste <ul style="list-style-type: none"> • All residues are recycled or handled and conveyed according to waste legislation. • Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products • Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.
Contributing scenario (2) controlling worker exposure
Product characteristic: see sections 3 (composition) & 9 (phys-chem properties) of SDS <ul style="list-style-type: none"> • The concentration of ZnO in the mixtures can be up to >25% but is usually of the order of <= 5%, depending on the application. • The preparation is in the liquid state, as a paste or dispersion or other viscous or polymerized matrix, with a low level of dustiness; however, powder forms can occur, medium dustiness is therefore applied as a worst case
Amounts used: Max 5000T/y = 20 T/d = 7T/shift depending on the application.
Frequency and duration of use/exposure: 8 hour shifts (default worst case) are assumed as starting point
Human factors not influenced by risk management Uncovered body parts (potentially) face can be exposed as a result of the nature of the activity
Other given operational conditions affecting workers exposure <ul style="list-style-type: none"> • Wet processes • All indoor processes in confined area.
Technical conditions and measures at process level (source) to prevent release: see section 8
Technical conditions and measures to control dispersion from source towards the worker: see section 8 LEV in work area: efficiency 84% (generic LEV)
Organisational measures to prevent /limit releases, dispersion and exposure: see section 8
Conditions and measures related to personal protection, hygiene and health evaluation: see section 8 In particular, when PROC 7, 11, 19 are involved, respiratory protection is recommended

Exposure estimation and reference to its source: not relevant, refer to CSR.

Risks for workers and to the environment have to be assessed considering the PNECs and DNELs mentioned under SDS section 8

Guidance to DU to evaluate whether he works inside the boundaries set by the (G)ES.

Occupational exposure/environmental emissions

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. Detailed guidance for evaluation of ES can be acquired via your supplier or from the ECHA website (guidance R14, R16). Environmental and human exposure can be measured or modelled (more information on tools available in SDS section 8).

In addition, bioavailability corrections can be integrated in the exposure assessment, if the environmental parameters that are needed for the calculations are documented (see SDS section 8)

GES ZnO-6: Industrial and professional use of solid substrates containing less than 25%w/w of ZnO. SU: 0 (Nace C23.1., C23.4., F43.3.4.), 3, 5, 6b, 9, 10, 13, 16, 17,20, 22 PROC: 4, 5 ,6, 7, 8b, 9,10, 11, 13, 14, 19, 21, 22, 26 PC: 1, 8, 9a, 9b, 9c,14,15, 18, 19, 20, 21, 23, 28, 29, 33, 34, 35, 39, 0(UCN F40000, G15000) AC: 1, 2, 4, (Taric 6813.81, 6911), 0 (coatings for art and creative items) ERC: 2, 4, 5, 8a, 8d, 10a, 10b, 11a, 12a
This scenario covers both the industrial scale processes and professional use. In the described process, the ZnO containing preparation/mixture is further processed, involving potentially the following steps: <ul style="list-style-type: none"> reception/unpacking of material Final application, embedding, or shaping to produce the end product or article.
Contributing scenario (1) controlling environmental exposure
Product characteristics: see sections 3 (composition) & 9 (phys-chem properties) of SDS ZnO (or Zn compound) in the article is < 25%
Amounts used: Typical quantities for both Industrial and professional are 50T/y (typical), maximum 500T/y (in industrial setting).
Frequency and duration of use: Continuous production is assumed as a worst case.
Environment factors not influenced by risk management: Flow rate of receiving surface water default: 18,000 m3/d, unless specified otherwise
Other given operational conditions affecting environmental exposure <ul style="list-style-type: none"> Solid, so in principle all dry processes throughout, no process waters. Even when no process waters occur (with dry process throughout), some non-process water can be generated containing zinc (e.g. from cleaning) In industrial and professional setting, all processes are performed indoor in a confined area. All residues containing zinc are recycled.
Technical conditions and measures at process level (source) to prevent release: See section 8
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil In industrial and professional setting, the following applies: <ul style="list-style-type: none"> No process waters, so possible emissions to water are limited and non-process related. By exposure modeling it is predicted that at use quantities of >100T/y, refinement of the exposure assessment to water and sediment needs to be made (exposure assessment based on real measured data and local parameters). Treatment of the emissions to water may be needed under such conditions. See section 8 of SDS for air and water emissions abatement systems
Organizational measures to prevent/limit release from site: see section 8 of SDS
Conditions and measures related to municipal sewage treatment plant In cases where applicable: default size of the municipal STP (2000 m3/d), unless specified otherwise.
Conditions and measures related to external treatment of waste for disposal <ul style="list-style-type: none"> If any, all hazardous wastes are treated by certified contractors according to EU and national legislation. Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.
Conditions and measures related to external recovery of waste: All residues are recycled or handled and conveyed according to the waste legislation.
Contributing scenario (2) controlling worker exposure
Product characteristic: see sections 3 (composition) & 9 (phys-chem properties) of SDS <ul style="list-style-type: none"> The concentration of ZnO (or Zn compound) in the mixture is < 25% The mixture is in the solid state, with a low level of dustiness; however, powder forms can occur, the medium dustiness is therefore applied as a worst case.
Amounts used <ul style="list-style-type: none"> Typical quantities for both Industrial and professional are 50 T/y (typical), or 0.15 T/day, 0.05 T/shift Maximum use quantity is 500T/y (1.5T/d, 0.5T/shift) in industrial setting.

Frequency and duration of use/exposure: 8 hour shifts (default worst case) are assumed as starting point
Human factors not influenced by risk management: Uncovered body parts (potentially) face can be exposed as a result of the nature of the activity
Other given operational conditions affecting workers exposure Industrial / Professional: <ul style="list-style-type: none"> • Dry processes: dry operational conditions throughout the process, no process waters; • Indoor processes in confined area.
Technical conditions and measures at process level (source) to prevent release Industrial /professional see section 8 of SDS
Technical conditions and measures to control dispersion from source towards the worker Industrial /professional: LEV in work area: efficiency 84% (generic LEV) See section 8 for more specific abatement systems
Organisational measures to prevent /limit releases, dispersion and exposure: see section 8 of SDS
Conditions and measures related to personal protection, hygiene and health evaluation: see section 8 of SDS

Exposure estimation and reference to its source: not relevant, refer to CSR.

Risks for workers and to the environment have to be assessed considering the PNECs and DNELs mentioned under SDS section 8

Guidance to DU to evaluate whether he works inside the boundaries set by the (G)ES.

Occupational exposure/environmental emissions

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. Detailed guidance for evaluation of ES can be acquired via your supplier or from the ECHA website (guidance R14, R16). Environmental and human exposure can be measured or modelled (more information on tools available in SDS section 8).

In addition, bioavailability corrections can be integrated in the exposure assessment, if the environmental parameters that are needed for the calculations are documented (see SDS section 8)

GES ZnO-7: Industrial and professional use of dispersions, pastes and polymerised substrates containing less than 25%w/w of ZnO.
SU:1, 3, 4, 5, 6, 9, 10, 11, 12, 13, 15, 17, 18, 19, 20, 22, 0 (Nace C22.1.1.) PROC: 1, 4, 5, 7, 8a, 8b, 9, 10, 11, 13, 14, 15, 17, 19, 21, 24 PC: 1, 4, 8, 9a, 9b, 9c, 14,, 15, 18, 19, 20, 21, 24, 25, 28, 29, 31, 32, 33, 35, 39 AC: 1, 2, 3, 5, 7, 10, 13, 0 (coatings for art and creative items) ERC: 5, 6d, 8a, 8c, 8d, 8f, 10a, 10b, 11a, 12a
This scenario covers both the industrial scale processes and professional use. In the described process, the ZnO containing preparation/mixture is further processed, involving potentially the following steps: <ul style="list-style-type: none"> • Reception/unpacking of material • Final application, spraying, embedding or to produce the end product or article.
Contributing scenario (1) controlling environmental exposure
Product characteristics: see sections 3 (composition) & 9 (phys-chem properties) of SDS ZnO (or Zn compound) in the article is < 25%
Amounts used: Typical quantities for both industrial and professional are 50T/y (typical), maximum 500T/y (in industrial setting).
Frequency and duration of use: Continuous production is assumed as a worst case
Environment factors not influenced by risk management: Flow rate of receiving surface water default: 18,000 m ³ /d, unless specified otherwise
Other given operational conditions affecting environmental exposure <ul style="list-style-type: none"> • Wet processes. All process and non-process waters should be recycled internally to a maximal extent. Even when no process waters occur, some non-process water can be generated containing zinc (e.g. from cleaning) • In industrial and professional setting, all processes are performed in a confined area. All residues containing zinc are recycled.
Technical conditions and measures at process level (source) to prevent release: see section 8

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil See section 8 of SDS By exposure modeling it is predicted that at use quantities of >100T/y, refinement of the exposure assessment to water and sediment needs to be made (exposure assessment based on real measured data and local parameters). Treatment of the emissions to water may be needed under such conditions.
Organizational measures to prevent/limit release from site: see section 8 of SDS
Conditions and measures related to municipal sewage treatment plant: In cases where applicable, default size of the municipal STP (2000 m ³ /d), unless specified otherwise.
Conditions and measures related to external treatment of waste for disposal <ul style="list-style-type: none">• If any, all hazardous wastes are treated by certified contractors according to EU and national legislation.• Users of Zn and Zn-compounds have to favour the recycling channels of the end-of-life products• Users of Zn and Zn-compounds have to minimize Zn-containing waste, promote recycling routes and, for the remaining, dispose the waste streams according the Waste regulation.
Conditions and measures related to external recovery of waste All residues are recycled or handled and conveyed according to waste legislation.

Contributing scenario (2) controlling worker exposure
Product characteristic: see sections 3 (composition) & 9 (phys-chem properties) of SDS <ul style="list-style-type: none">• Particles can occur sporadically, the low level of dustiness is basically applied.• Most of the processes imply the use of solutions or pastes; the “solution status” is therefore taken as the worst case.
Amounts used <ul style="list-style-type: none">• Typical quantities for both Industrial and professional are 50 T/y (typical), or 0.15 T/day, 0.05 T/shift.• Maximum use quantity is 500T/y (1.5T/d, 0.5T/shift) in industrial setting.
Frequency and duration of use/exposure: 8 hour shifts (default worst case) are assumed as starting point
Human factors not influenced by risk management Uncovered body parts, (potentially) face exposed as a result of the nature of the activity
Other given operational conditions affecting workers exposure Industrial / Professional: Wet processes, all indoor in confined area.
Technical conditions and measures at process level (source) to prevent release: see section 8
Technical conditions and measures to control dispersion from source towards the worker Industrial /professional: LEV in work area: efficiency 84% (generic LEV). See section 8 of SDS
Organisational measures to prevent /limit releases, dispersion and exposure: see section 8 of SDS
Conditions and measures related to personal protection, hygiene and health evaluation: see section 8 of SDS