

## Zinc Aluminium Alloys - Galvanizing

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

#### 1.1. Product identifier

**Product name** : Zinc Aluminium Alloys - Galvanizing  
**Synonyms** : Galfan 10; Galfan 7; zinc alloy for continuous galvanizing, CGG, ZnAl; Zinc Aluminium alloys, ZnAl alloys  
**Registration number REACH** : Not applicable (mixture)  
**Product type REACH** : Mixture/alloy

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

##### 1.2.1 Relevant identified uses

Metal industry: continuous galvanization of steelplate, thermal galvanization, alloy formation  
 Industrial applications: sheet zinc for construction, welding materials, anodes for anti-corrosion protection  
 Metal industry: hot dip galvanizing

##### 1.2.2 Uses advised against

No uses advised against known

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

##### Supplier of the safety data sheet

Nyrstar Belgium N.V. on behalf of Nyrstar Sales & Marketing A.G.  
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 infoSDS@nyrstar.com

##### Manufacturer of the product

Nyrstar Sales & Marketing SA  
 1 Rue de Jargonnant  
 CH-1207 Geneva  
 infoSDS@nyrstar.com

#### 1.4. Emergency telephone number

24h/24h (Telephone advice: English, French, German, Dutch) :  
 +32 14 58 45 45 (BIG)

### SECTION 2: Hazards identification

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

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

The criteria of PBT and vPvB as listed in Annex XIII of Regulation (EC) No 1907/2006 do not apply to inorganic substances  
 The melting down of moist metal leads to explosion risk  
 Heated product causes burns

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## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Not applicable

### 3.2. Mixtures

Name REACH Registration No	CAS No EC No	Conc. (C)	Classification according to CLP	Note	Remark	M-factors and ATE
zinc 01-2119467174-37	7440-66-6 231-175-3	83.80% <=C<=100%		(2)(10)	Constituent	
aluminium	7429-90-5 231-072-3	0% <=C<=15.90 %		(2)	Constituent	
lanthanum	7439-91-0 231-099-0	0% <=C<=0.06%	Water-react. 1; H260 EUH014	(1)	Constituent	
cerium	7440-45-1 231-154-9	0% <=C<=0.06%	Flam. Sol. 1; H228	(1)	Constituent	

(1) For H- and EUH-statements in full: see section 16

(2) Substance with a Community workplace exposure limit

(10) Subject to restrictions of Annex XVII of Regulation (EC) No. 1907/2006

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

#### General:

Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

#### After inhalation:

After inhalation of fume: Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

#### After skin contact:

In case of burns: Wash immediately with lots of water (15 minutes)/shower. Remove clothing while washing. Do not tear off solidified product from the skin. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage. Consult a doctor/medical service. If burned surface > 10%: take victim to hospital.

#### After eye contact:

Rinse immediately with plenty of water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Take victim to an ophthalmologist.

#### After ingestion:

Not applicable.

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

#### 4.2.1 Acute symptoms

##### After inhalation:

AFTER INHALATION OF DUST: Irritation of the nasal mucous membranes. Dry/sore throat. Coughing. AFTER INHALATION OF FUME: Feeling of weakness. Metal fume fever. Vomiting. Nausea.

##### After skin contact:

IF MELTING: Burns.

##### After eye contact:

IF MELTING: Burns.

##### After ingestion:

Not applicable.

#### 4.2.2 Delayed symptoms

No effects known.

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

If applicable and available it will be listed below.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

#### 5.1.1 Suitable extinguishing media:

Adapt extinguishing media to the environment for surrounding fires.

#### 5.1.2 Unsuitable extinguishing media:

Not applicable.

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

On burning formation of metal oxides (zinc oxide). In molten state: violent to explosive reaction with water (moisture).

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## 5.3. Advice for firefighters

### 5.3.1 Instructions:

Dilute toxic gases with water spray. In case of metal bath fire: add metal blocks. When cooling/extinguishing: no water in the substance.

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

Gloves (EN 374). Protective clothing (EN 14605 or EN 13034). Heat/fire exposure: self-contained breathing apparatus (EN 136 + EN 137).

## SECTION 6: Accidental release measures

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

No naked flames. Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: have neighbourhood close doors and windows.

#### 6.1.1 Protective equipment for non-emergency personnel

See section 8.2

#### 6.1.2 Protective equipment for emergency responders

Gloves (EN 374). Protective clothing (EN 14605 or EN 13034).

Suitable protective clothing

See section 8.2

### 6.2. Environmental precautions

No data available

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

If melted: allow liquid to solidify before taking it up. Pick-up the material. Wash clothing and equipment after handling.

### 6.4. Reference to other sections

See section 13.

## SECTION 7: Handling and storage

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

### 7.1. Precautions for safe handling

Avoid raising dust. Keep away from naked flames/heat. Observe strict hygiene. On (re)melting down: dry and preheat installation before use. Add only dry material to the metal bath.

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

#### 7.2.1 Safe storage requirements:

Storage temperature: Temperature above dew point. Store in a dry area. Keep at temperature above dew point. Meet the legal requirements.

#### 7.2.2 Keep away from:

Heat sources, (strong) acids.

#### 7.2.3 Suitable packaging material:

No data available

#### 7.2.4 Non suitable packaging material:

No data available

### 7.3. Specific end use(s)

If applicable and available, exposure scenarios are attached in annex. See information supplied by the manufacturer.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### 8.1.1 Occupational exposure

##### a) Occupational exposure limit values

If limit values are applicable and available these will be listed below.

#### Belgium

Aluminium (métal et composés insolubles)	Time-weighted average exposure limit 8 h	1 mg/m <sup>3</sup> (1)
Zinc (oxyde de)	Time-weighted average exposure limit 8 h	2 mg/m <sup>3</sup> (1)
	Short time value	10 mg/m <sup>3</sup> (1)

(1) Fraction alvéolaire

#### France

Aluminium (métal)	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	10 mg/m <sup>3</sup>
Aluminium (pulvérulent)	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	5 mg/m <sup>3</sup>
Zinc (oxyde de)	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	10 mg/m <sup>3</sup> (1)
	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	5 mg/m <sup>3</sup> (2)

(1) poussières

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(2) fumées

## Germany

Aluminium und seine schwerlöslichen Verbindungen	Time-weighted average exposure limit 8 h (MAK)	0.05 mg/m <sup>3</sup> (1)
	Time-weighted average exposure limit 8 h (MAK)	0.5 mg/m <sup>3</sup> (2)
Zink und seine anorganischen Verbindungen	Time-weighted average exposure limit 8 h (MAK)	0.1 mg/m <sup>3</sup> (3)
	Time-weighted average exposure limit 8 h (MAK)	2 mg/m <sup>3</sup> (4)

(1) Alveolengängige Fraktion; UF: II(8)

(2) Einatembare Fraktion; UF: II(8)

(3) Alveolengängige Fraktion; UF: I(4)

(4) Einatembare Fraktion; UF: I(2); Zinkchlorid: Kurzzeitkategorie I(1)

## Austria

Aluminium (als Metall) Aluminiumoxid und Aluminiumhydroxid	Tagesmittelwert	10 mg/m <sup>3</sup> (1)
	Tagesmittelwert	5 mg/m <sup>3</sup> (2)
	Kurzzeitwert 60(Miw) 2x	10 mg/m <sup>3</sup> (2)
	Kurzzeitwert 60(Miw) 2x	20 mg/m <sup>3</sup> (1)
Zinkoxid-Rauch	Tagesmittelwert (MAK)	5 mg/m <sup>3</sup> (2)

(1) Einatembare Fraktion

(2) Alveolengängige Fraktion

## UK

Aluminium metal	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	10 mg/m <sup>3</sup> (1)
	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	4 mg/m <sup>3</sup> (2)

(1) Inhalable dust

(2) Respirable dust

## Ireland

Aluminium metal;	Time-weighted average exposure limit 8 h (Advisory occupational exposure limit values)	1 mg/m <sup>3</sup> (1)
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(1) (R)

## USA (TLV-ACGIH)

Aluminium metal and insoluble compounds	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	1 mg/m <sup>3</sup> (1)
Zinc oxide	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	2 mg/m <sup>3</sup> (1)
	Short time value (TLV - Adopted Value)	10 mg/m <sup>3</sup> (1)

(1) (R): Respirable fraction

### b) National biological limit values

If limit values are applicable and available these will be listed below.

## Germany

Aluminium (Aluminium)	Urin: am schichtende, bei langzeitexposition nach mehreren vorangegangenen schichten	50 µg/g Kreatinin	
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### 8.1.2 Sampling methods

Product name	Test	Number
Aluminium	NIOSH	7013
Aluminum (Al)	NIOSH	7302
Aluminum (Al)	NIOSH	7304
Aluminum (Al)	NIOSH	7306
Aluminum (Al)	NIOSH	8310
Aluminum (Elements)	NIOSH	7300
Aluminum (Elements, aqua regia ashing)	NIOSH	7301
Aluminum (Elements, hot block/HCl/HNO3 digestion)	NIOSH	7303
Aluminum	OSHA	ID 121
Lanthanum (Elements on wipes)	NIOSH	9102
Lanthanum (Elements)	NIOSH	7300
Lanthanum (Elements, aqua regia ashing)	NIOSH	7301
Lanthanum (Elements, hot block/HCl/HNO3 digestion)	NIOSH	7303
Lanthanum (La)	NIOSH	8005
Lanthanum	NIOSH	7306
Zinc & Cpds (as Zn)	NIOSH	7030
Zinc (Elements on wipes)	NIOSH	9102
Zinc (Elements)	NIOSH	7300
Zinc (Elements, aqua regia ashing)	NIOSH	7301
Zinc (Elements, hot block/HCl/HNO3 digestion)	NIOSH	7303

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Product name	Test	Number
Zinc (Zn)	NIOSH	7306
Zinc (Zn)	NIOSH	8005
Zinc (Zn)	NIOSH	8200
Zinc (Zn)	NIOSH	8310
Zinc Oxide	NIOSH	7030
Zinc Oxide	NIOSH	7502
Zinc Oxide	OSHA	ID 121
Zinc Oxide	OSHA	ID 143
Zinc	NIOSH	7030
Zinc	OSHA	1006
Zinc	OSHA	ID 121
Zinc	OSHA	ID 125G

## 8.1.3 Applicable limit values when using the substance or mixture as intended

If limit values are applicable and available these will be listed below.

## 8.1.4 Threshold values

### DNEL/DMEL - Workers

#### aluminium

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects inhalation	3.72 mg/m <sup>3</sup>	

#### cerium

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects inhalation	8.13 mg/m <sup>3</sup>	
	Long-term systemic effects dermal	5.07 mg/kg bw/day	

### DNEL/DMEL - General population

#### cerium

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects inhalation	4.8 mg/m <sup>3</sup>	
	Long-term systemic effects dermal	3.04 mg/kg bw/day	
	Long-term systemic effects oral	3.04 mg/kg bw/day	

### PNEC

#### zinc

Compartments	Value	Remark
Fresh water	19.7 µg/l	Zinc ion
Marine water	7.7 µg/l	Zinc ion
STP	100 µg/l	Zinc ion
Fresh water sediment	146.9 mg/kg sediment dw	Zinc ion
Marine water sediment	162.2 mg/kg sediment dw	Zinc ion
Soil	83.1 mg/kg soil dw	Zinc ion

#### aluminium

Compartments	Value	Remark
Fresh water	74.9 µg/l	
STP	20 mg/l	

#### cerium

Compartments	Value	Remark
Fresh water	0.6 mg/l	
Marine water	60.9 µg/l	
STP	60.9 mg/l	

## 8.1.5 Control banding

If applicable and available it will be listed below.

## 8.2. Exposure controls

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

### 8.2.1 Appropriate engineering controls

Avoid raising dust. Keep away from naked flames/heat. Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection.

### 8.2.2 Individual protection measures, such as personal protective equipment

Observe strict hygiene. Do not eat, drink or smoke during work.

#### a) Respiratory protection:

Dust production: dust mask with filter type P2.

#### b) Hand protection:

Gloves, On heating: heat insulating gloves (EN 407).

Materials	Remark
leather	Good resistance

#### c) Eye protection:

On (re)melting down: face shield.

#### d) Skin protection:

Protective clothing (EN 14605 or EN 13034). On (re)melting down: heatproof clothing (EN 11612). Protective clothing against molten metal splash (EN 9185). Protective clothing for workers exposed to heat (EN 11612). Safety shoes type S3.

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**8.2.3 Environmental exposure controls:**  
See sections 6.2, 6.3 and 13

## SECTION 9: Physical and chemical properties

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

Physical form	Solid
	Metal
	Physical state depending on the production process
Colour	Grey
Odour	Odourless
Odour threshold	Not applicable
Melting point	382 °C - 450 °C
Boiling point	900 °C - 910 °C
Flammability	Not classified as flammable
Explosion limits	No data available (test not performed)
Flash point	Not applicable (solid)
Auto-ignition temperature	No data available (test not performed)
Decomposition temperature	No data available (test not performed)
pH	Not applicable (non-soluble in water)
Kinematic viscosity	No data available (test not performed)
Dynamic viscosity	No data available (test not performed)
Solubility	Water ; insoluble
Log Kow	Not applicable (inorganic)
Vapour pressure	No data available (test not performed)
Absolute density	5600 kg/m <sup>3</sup>
Relative density	5.6
Relative vapour density	Not applicable (solid)
Particle size	No data available (test not performed)

### 9.2. Other information

No data available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No data available.

### 10.2. Chemical stability

Stable under normal conditions.

### 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

#### Precautionary measures

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

### 10.5. Incompatible materials

(strong) acids.

### 10.6. Hazardous decomposition products

Reacts with (some) acids: release of highly flammable gases/vapours (hydrogen). On burning formation of metal oxides (zinc oxide).

## SECTION 11: Toxicological information

### 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

#### 11.1.1 Test results

#### Acute toxicity

#### Zinc Aluminium Alloys - Galvanizing

No (test)data on the mixture available

#### zinc

Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Remark
Oral	LD50	OECD 401	> 2000 mg/kg bw		Rat (male / female)	Experimental value	
Dermal						Data waiving	
Inhalation (dust)	LC50	OECD 403	> 5.41 mg/l	4 weeks (daily, 5 days / week)	Rat (male / female)	Experimental value	

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## aluminium

Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Remark
Oral	LD50	Equivalent to OECD 401	> 15900 mg/kg bw		Rat (male / female)	Read-across	
Dermal						Data waiving	
Inhalation (aerosol)	LC50	Equivalent to OECD 403	> 888 mg/m <sup>3</sup> air	4 h	Rat (male)	Experimental value	

## cerium

Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Remark
Oral	LD50	EPA OTS 798.1100	> 5000 mg/kg bw		Rat (male / female)	Read-across	
Dermal						Data waiving	
Inhalation (aerosol)	LC50	OECD 403	> 5.05 mg/l air	4 h	Rat (male / female)	Read-across	

## Conclusion

Not classified for acute toxicity

## Corrosion/irritation

### Zinc Aluminium Alloys - Galvanizing

No (test)data on the mixture available

## zinc

Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	Remark
Eye	Not irritating				Rabbit	Literature study	
Not applicable (in vitro test)	Not irritating				In vitro: SkinEthic Reconstituted epithelium model	Experimental value	
Inhalation (ZnO, metal oxides)	Not irritating					Literature study	

## aluminium

Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	Remark
Eye	Not irritating	Other		1; 24; 48; 72; 168 hours	Rabbit	Read-across	Single treatment without rinsing
Skin	Not irritating	Equivalent to OECD 404	24 h	24; 48; 72 hours	Rabbit	Read-across	

## cerium

Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	Remark
Eye						Data waiving	
Not applicable (in vitro test)		In vitro skin irritation/corrosion				Data waiving	

## Conclusion

Not classified as irritating to the skin

Not classified as irritating to the eyes

Not classified as irritating to the respiratory system

## Respiratory or skin sensitisation

### Zinc Aluminium Alloys - Galvanizing

No (test)data on the mixture available

## zinc

Route of exposure	Result	Method	Exposure time	Observation time point	Species	Value determination	Remark
Dermal (on the ears)	Sensitizing	Equivalent to OECD 429			Mouse (female)	Experimental value	
Skin	Not sensitizing	OECD 406			Guinea pig (male / female)	Experimental value	

## aluminium

Route of exposure	Result	Method	Exposure time	Observation time point	Species	Value determination	Remark
Skin	Not sensitizing			24 hours	Guinea pig (male)	Read-across	
Intratracheal instillation	Not sensitizing				Mouse (male)	Read-across	

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# Zinc Aluminium Alloys - Galvanizing

## cerium

Route of exposure	Result	Method	Exposure time	Observation time point	Species	Value determination	Remark
Skin						Data waiving	

## Conclusion

Not classified as sensitizing for skin

Not classified as sensitizing for inhalation

## Specific target organ toxicity

### Zinc Aluminium Alloys - Galvanizing

No (test)data on the mixture available

## zinc

Route of exposure	Parameter	Method	Value	Organ/Effect	Exposure time	Species	Value determination	Remark
Oral (stomach tube)	NOAEL	OECD 408	31.25 mg/kg bw/day	Blood (no effect)	90 day(s)	Rat (male / female)	Experimental value	
Dermal		OECD 411		No effect	90 day(s)	Rat (male / female)	Experimental value	Not quantifiable
Inhalation (aerosol)	NOAEC	OECD 412	0.47 mg/m³ air	No effect	4 weeks (6h / day, 5 days / week)	Rat (male / female)	Experimental value	
Inhalation (ZnO, metal oxides)		Human observation		No effect		Human	Literature study	

## aluminium

Route of exposure	Parameter	Method	Value	Organ/Effect	Exposure time	Species	Value determination	Remark
Oral (stomach tube)	NOAEL (P/F1)	OECD 422	200 mg/kg bw/day	No effect	28 day(s) - 53 day (s)	Rat (male / female)	Read-across	
Inhalation	LOAEC	Equivalent to OECD 413	50 mg/m³ air	Lung tissue affection/degeneration	15 weeks (6h / day, 5 days / week)	Rat	Experimental value	

## cerium

Route of exposure	Parameter	Method	Value	Organ/Effect	Exposure time	Species	Value determination	Remark
Oral (stomach tube)	NOEL	OECD 422	150 mg/kg bw/day	No effect		Rat (male / female)	Read-across	
Dermal							Data waiving	
Inhalation (aerosol)	NOEC	OECD 413	< 0.005 mg/l air	No effect	13 weeks (6h / day, 5 days / week)	Rat (male / female)	Read-across	

## Conclusion

Not classified for subchronic toxicity

## Mutagenicity (in vitro)

### Zinc Aluminium Alloys - Galvanizing

No (test)data on the mixture available

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

## zinc

Result	Method	Test substrate	Effect	Value determination	Remark
Negative with metabolic activation, negative without metabolic activation	OECD 471	Bacteria (S. typhimurium and E. coli)		Experimental value	
Negative with metabolic activation, negative without metabolic activation	OECD 473	Chinese hamster lung fibroblasts (V79)		Experimental value	

## aluminium

Result	Method	Test substrate	Effect	Value determination	Remark
Negative with metabolic activation, negative without metabolic activation	OECD 476	Mouse (lymphoma L5178Y cells)		Read-across	

## cerium

Result	Method	Test substrate	Effect	Value determination	Remark
Negative with metabolic activation, negative without metabolic activation	EU Method B.17	Chinese hamster lung fibroblasts (V79)	No effect	Read-across	

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## Mutagenicity (in vivo)

### Zinc Aluminium Alloys - Galvanizing

No (test)data on the mixture available

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

#### zinc

Result	Method	Exposure time	Test substrate	Organ/Effect	Value determination	Remark
Negative (Inhalation (aerosol) )	OECD 474	2 weeks (6h / day, 5 days / week)	Rat (male / female)	Bone marrow (no effect)	Experimental value	

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

#### aluminium

Result	Method	Exposure time	Test substrate	Organ/Effect	Value determination	Remark
Negative	OECD 474		Rat (male / female)		Read-across	

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

## Conclusion

Not classified for mutagenic or genotoxic toxicity

## Carcinogenicity

### Zinc Aluminium Alloys - Galvanizing

No (test)data on the mixture available

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

#### zinc

Route of exposure	Parameter	Method	Value	Organ/Effect	Exposure time	Species	Value determination	Remark
Oral (drinking water)	NOAEL	Carcinogenic toxicity study	> 22000 mg/l	No carcinogenic effect	52 week(s)	Mouse (male / female)	Experimental value	

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

#### aluminium

Route of exposure	Parameter	Method	Value	Organ/Effect	Exposure time	Species	Value determination	Remark
Inhalation	LOAEC	Equivalent to OECD 413	50 mg/m <sup>3</sup> air	Lungs (histopathological changes)	15 weeks (6h / day, 5 days / week)		Experimental value	

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

#### cerium

Route of exposure	Parameter	Method	Value	Organ/Effect	Exposure time	Species	Value determination	Remark
Inhalation (aerosol)							Data waiving	
Dermal							Data waiving	
Oral							Data waiving	

## Conclusion

Not classified for carcinogenicity

## Reproductive toxicity

### Zinc Aluminium Alloys - Galvanizing

No (test)data on the mixture available

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

#### zinc

Category	Parameter	Method	Value	Exposure time	Species	Effect	Value determination	Remark
Developmental toxicity (Inhalation (aerosol))	NOAEC	OECD 414	7.5 mg/m <sup>3</sup> air	14 days (6h / day)	Rat	No effect	Experimental value	
Maternal toxicity (Inhalation (aerosol))	NOAEC	OECD 414	1.5 mg/m <sup>3</sup> air	14 days (6h / day)	Rat	No effect	Experimental value	
Effects on fertility (Oral (stomach tube))	LOAEL	Equivalent to OECD 416	7.5 mg/kg bw/day		Rat (male / female)	Adverse effects on fertility	Experimental value	

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

# Zinc Aluminium Alloys - Galvanizing

## aluminium

Category	Parameter	Method	Value	Exposure time	Species	Effect	Value determination	Remark
Developmental toxicity	NOAEL	Equivalent to OECD 414	266 mg/kg bw/day	10 day(s)	Rat	No effect	Read-across	
Maternal toxicity	NOAEL	Other	3225 mg/kg bw/day	385 day(s)	Rat (female)	No effect	Read-across	
Effects on fertility	NOAEL (P/F1)	OECD 422	1000 mg/kg bw	28 day(s) - 53 day (s)	Rat (male / female)	No effect	Read-across	

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

## cerium

Category	Parameter	Method	Value	Exposure time	Species	Effect	Value determination	Remark
Developmental toxicity	LOAEC		80 mg/kg bw		Mouse (female)	Foetus (reduced fetal bodyweights)	Read-across	Single treatment
Effects on fertility	NOEL (P)	OECD 422	1000 mg/kg bw/day	4 weeks (daily)	Rat (male / female)	No effect	Read-across	

## Conclusion

Not classified for reprotoxic or developmental toxicity

## Aspiration hazard

### Zinc Aluminium Alloys - Galvanizing

Not classified for aspiration toxicity

## Toxicity other effects

### Zinc Aluminium Alloys - Galvanizing

No (test)data on the mixture available

## Chronic effects from short and long-term exposure

### Zinc Aluminium Alloys - Galvanizing

No effects known.

## 11.2. Information on other hazards

No evidence of endocrine disrupting properties

## SECTION 12: Ecological information

### 12.1. Toxicity

#### Zinc Aluminium Alloys - Galvanizing

No (test)data on the mixture available

Judgement of the mixture is based on the relevant ingredients

#### zinc

	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity crustacea	NOEC		308 µg/l		Daphnia magna			Literature study; Zinc ion
Toxicity algae and other aquatic plants	NOEC		41 µg/l		Pseudokirchneriella subcapitata			Literature study; Acute
	NOEC		11 µg/l - 118 µg/l		Pseudokirchneriella subcapitata			Literature study; Chronic
Toxicity sediment organisms	NOEC		218 µg/l - 1101 µg/l					Literature study; Zinc ion

	Parameter	Method	Value	Duration	Species	Value determination
Toxicity soil micro-organisms	NOEC		31.2 mg/kg soil dw - 8003.5 mg/kg soil dw			Literature study
Toxicity terrestrial plants	NOEC		31.2 mg/kg soil dw - 8003.5 mg/kg soil dw			Literature study

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# Zinc Aluminium Alloys - Galvanizing

## aluminium

	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LC50	ASTM E729-96	> 218.64 mg/l	96 h	Pimephales promelas	Semi-static system	Fresh water	Weight of evidence; GLP
Acute toxicity crustacea	LC50	US EPA	0.72 mg/l - 99.6 mg/l	48 h	Ceriodaphnia dubia	Semi-static system	Fresh water	Weight of evidence; GLP
Toxicity algae and other aquatic plants	ErC50	OECD 201	1.05 mg/l	72 h	Pseudokirchneriella subcapitata	Static system	Fresh water	Weight of evidence; GLP
	NOEC	OECD 201	0.28 mg/l	72 h	Pseudokirchneriella subcapitata	Static system	Fresh water	Weight of evidence; GLP
Long-term toxicity fish	NOEC	US EPA	56.48 mg/l	7 day(s)	Pimephales promelas	Semi-static system	Fresh water	Weight of evidence; GLP
Long-term toxicity aquatic crustacea	NOEC	OECD 211	0.076 mg/l	21 day(s)	Daphnia magna	Semi-static system	Fresh water	Weight of evidence; Reproduction
Toxicity aquatic micro-organisms								Data waiving

	Parameter	Method	Value	Duration	Species	Value determination
Toxicity soil micro-organisms						Data waiving
Toxicity terrestrial plants						Data waiving
Toxicity birds						Data waiving

No classification for aquatic toxicity since the toxicity limits are above the water solubility

## cerium

	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LL50	OECD 203	> 100 mg/l	96 h	Oncorhynchus mykiss	Semi-static system	Fresh water	Read-across; GLP
Acute toxicity crustacea	LL50	OECD 202	> 100 mg/l	48 h	Daphnia magna	Static system	Fresh water	Read-across; GLP
Toxicity algae and other aquatic plants	EL50	OECD 201	> 100 mg/l	72 h	Scenedesmus subspicatus	Static system	Fresh water	Read-across; GLP
Long-term toxicity aquatic crustacea	NOELR	OECD 211	≥ 100 mg/l	21 day(s)	Daphnia magna	Semi-static system	Fresh water	Read-across; GLP
Toxicity aquatic micro-organisms	NOEC	OECD 209	≥ 1000 mg/l	3 h	Activated sludge	Static system	Fresh water	Read-across; GLP

## Conclusion

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

## 12.2. Persistence and degradability

### aluminium

#### Biodegradation water

Method	Value	Duration	Value determination
			Data waiving

#### Biodegradation soil

Method	Value	Duration	Value determination
			Data waiving

## Conclusion

### Water

Biodegradability: not applicable

## 12.3. Bioaccumulative potential

### Zinc Aluminium Alloys - Galvanizing

#### Log Kow

Method	Remark	Value	Temperature	Value determination
	Not applicable (inorganic)			

### zinc

#### Log Kow

Method	Remark	Value	Temperature	Value determination
	Not applicable (inorganic)			

### aluminium

#### Log Kow

Method	Remark	Value	Temperature	Value determination
	No data available			

# Zinc Aluminium Alloys - Galvanizing

## cerium

### BCF other aquatic organisms

Parameter	Method	Value	Duration	Species	Value determination
BCF		30.74	5 day(s)	Mollusca	Experimental value

### Log Kow

Method	Remark	Value	Temperature	Value determination
	No data available			

### Conclusion

Does not contain bioaccumulative component(s)

## 12.4. Mobility in soil

### zinc

#### (log) Koc

Parameter	Method	Value	Value determination
	OECD 106	3.24	Literature study

### cerium

#### (log) Koc

Parameter	Method	Value	Value determination
log Koc	OECD 106	6.6	Read-across

### Conclusion

Contains component(s) that adsorb(s) into the soil

## 12.5. Results of PBT and vPvB assessment

The criteria of PBT and vPvB as listed in Annex XIII of Regulation (EC) No 1907/2006 do not apply to inorganic substances.

## 12.6. Endocrine disrupting properties

No evidence of endocrine disrupting properties

## 12.7. Other adverse effects

### Zinc Aluminium Alloys - Galvanizing

#### Greenhouse gases

None of the known components is included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

#### Ozone-depleting potential (ODP)

Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009)

### zinc

#### Greenhouse gases

Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

### aluminium

#### Greenhouse gases

Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

### lanthanum

#### Greenhouse gases

Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

### cerium

#### Greenhouse gases

Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

## SECTION 13: Disposal considerations

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

### 13.1. Waste treatment methods

#### 13.1.1 Provisions relating to waste

##### European Union

Can be considered as non hazardous waste according to Directive 2008/98/EC, as amended by Regulation (EU) No 1357/2014 and Regulation (EU) No 2017/997.

Waste material code (Directive 2008/98/EC, Decision 2000/0532/EC).

11 01 99 (wastes from chemical surface treatment and coating of metals and other materials (for example galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodising); wastes not otherwise specified). Depending on branch of industry and production process, also other waste codes may be applicable.

#### 13.1.2 Disposal methods

Recycle/reuse. Remove waste in accordance with local and/or national regulations. Do not discharge into drains or the environment.

#### 13.1.3 Packaging/Container

No data available

# Zinc Aluminium Alloys - Galvanizing

## SECTION 14: Transport information

### Road (ADR), Rail (RID), Inland waterways (ADN), Sea (IMDG/IMSBC), Air (ICAO-TI/IATA-DGR)

14.1. UN number or ID number	Transport	Not subject
14.2. UN proper shipping name		
14.3. Transport hazard class(es)		
Hazard identification number		
Class		
Classification code		
14.4. Packing group		
Packing group		
Labels		
14.5. Environmental hazards		
Environmentally hazardous substance mark	no	
14.6. Special precautions for user		
Special provisions		
Limited quantities		
14.7. Maritime transport in bulk according to IMO instruments		
Annex II of MARPOL 73/78	Not applicable	

## SECTION 15: Regulatory information

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

#### Special remark

This substance/mixture does not contain Per-and Polyfluoroalkyl Substances (PFAS). During alloy production, no PFAS is intentionally added as raw material or product additive.

#### European legislation:

VOC content Directive 2010/75/EU

VOC content	Remark
	Not applicable (inorganic)

Directive 2012/18/EU (Seveso III)

Not subject to registration according to Directive 2012/18/EU (Seveso III)

REACH Candidate list

Does not contain component(s) included in candidate list of substances of very high concern (SVHC) for authorisation (Article 59 of Regulation (EC) No 1907/2006)

REACH Annex XIV - Authorisation

Does not contain component(s) included in Annex XIV of Regulation (EC) No 1907/2006: list of substances subject to authorisation

REACH Annex XVII - Restriction

Contains component(s) subject to restrictions of Annex XVII of Regulation (EC) No 1907/2006: restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.

	Designation of the substance, of the group of substances or of the mixture	Conditions of restriction
· zinc	Substances falling within one or more of the following points: (a) substances classified as any of the following in Part 3 of Annex VI to Regulation (EC) No 1272/2008: — carcinogen category 1A, 1B or 2, or germ cell mutagen category 1A, 1B or 2, but excluding any such substances classified due to effects only following exposure by inhalation — reproductive toxicant category 1A, 1B or 2 but excluding any such substances classified due to effects only following exposure by inhalation — skin sensitiser category 1, 1A or 1B — skin corrosive category 1, 1A, 1B or 1C or skin irritant category 2 — serious eye damage category 1 or eye irritant category 2 (b) substances listed in Annex II to Regulation (EC) No 1223/2009 of the European Parliament and of the Council (c) substances listed in Annex IV to Regulation (EC) No 1223/2009 for which a condition is specified in at least one of the columns g, h and i of the table in that Annex (d) substances listed in Appendix 13 to this Annex.	Mixtures for tattooing purposes are subject to the restrictions of Regulation (EU) 2020/2081

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The ancillary requirements in paragraphs 7 and 8 of column 2 of this entry apply to all mixtures for use for tattooing purposes, whether or not they contain a substance falling within points (a) to (d) of this column of this entry.

## National legislation Belgium

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No data available

## National legislation The Netherlands

Zinc Aluminium Alloys - Galvanizing

No data available

## National legislation France

Zinc Aluminium Alloys - Galvanizing

No data available

## National legislation Germany

Zinc Aluminium Alloys - Galvanizing

WGK	nwg; Classification non-water polluting based on the components in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS) of 27 July 2005 (Anhang 4)
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aluminium

TA-Luft	5.2.1
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cerium

TA-Luft	5.2.1
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## National legislation Austria

Zinc Aluminium Alloys - Galvanizing

No data available

## National legislation United Kingdom

Zinc Aluminium Alloys - Galvanizing

No data available

## National legislation Ireland

Zinc Aluminium Alloys - Galvanizing

No data available

## Other relevant data

Zinc Aluminium Alloys - Galvanizing

No data available

aluminium

TLV - Carcinogen	Aluminium metal and insoluble compounds; A4
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## 15.2. Chemical safety assessment

No chemical safety assessment is required for a mixture.

zinc

A chemical safety assessment has been performed.

## SECTION 16: Other information

### Full text of any H- and EUH-statements referred to under section 3:

H228 Flammable solid.

H260 In contact with water releases flammable gases which may ignite spontaneously.

EUH014 Reacts violently with water.

(*)	INTERNAL CLASSIFICATION BY BIG
ADI	Acceptable daily intake
AOEL	Acceptable operator exposure level
ATE	Acute Toxicity Estimate
BCF	Bioconcentration Factor
BEI	Biological Exposure Indices
CLP (EU-GHS)	Classification, labelling and packaging (Globally Harmonised System in Europe)
DMEL	Derived Minimal Effect Level
DNEL	Derived No Effect Level
EC10	Effect Concentration 10 %
EC50	Effect Concentration 50 %
ErC50	EC50 in terms of reduction of growth rate
GLP	Good Laboratory Practice
LC0	Lethal Concentration 0 %
LC50	Lethal Concentration 50 %
LD50	Lethal Dose 50 %
LOAEC/LOAEL	Lowest Observed Adverse Effect Concentration/Lowest Observed Adverse Effect Level
NOAEC/NOAEL	No Observed Adverse Effect Concentration/No Observed Adverse Effect Level
NOEC/NOEL	No Observed Effect Concentration/No Observed Effect Level

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# Zinc Aluminium Alloys - Galvanizing

OECD	Organisation for Economic Co-operation and Development
PBT	Persistent, Bioaccumulative & Toxic
PNEC	Predicted No Effect Concentration
STP	Sludge Treatment Process
vPvB	very Persistent & very Bioaccumulative

This safety data sheet contains one or more exposure scenarios in an integrated form. Contents of the exposure scenario(s) have been included into relevant sections of this safety data sheet.

The information in this safety data sheet is based on data and samples provided to BIG. The sheet was written to the best of our ability and according to the state of knowledge at that time. The safety data sheet only constitutes a guideline for the safe handling, use, consumption, storage, transport and disposal of the substances/preparations/mixtures mentioned under point 1. New safety data sheets are written from time to time. Only the most recent versions may be used. Unless indicated otherwise word for word on the safety data sheet, the information does not apply to substances/preparations/mixtures in purer form, mixed with other substances or in processes. The safety data sheet offers no quality specification for the substances/preparations/mixtures in question. Compliance with the instructions in this safety data sheet does not release the user from the obligation to take all measures dictated by common sense, regulations and recommendations or which are necessary and/or useful based on the real applicable circumstances. BIG does not guarantee the accuracy or exhaustiveness of the information provided and cannot be held liable for any changes by third parties. This safety data sheet is only to be used within the European Union, Switzerland, Iceland, Norway and Liechtenstein. Any use outside of this area is at your own risk. Use of this safety data sheet is subject to the licence and liability limiting conditions as stated in your BIG licence agreement or when this is failing the general conditions of BIG. All intellectual property rights to this sheet are the property of BIG and its distribution and reproduction are limited. Consult the mentioned agreement/conditions for details.