

Material identification: **Zinc-aluminium-magnesium-coated sheet (ZM)**

Version: 1.0

Material number: TKE-169

Date of issue: 30.04.20296

Revised:

Printed: 30.04.2026

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1 Identification of the product and of the company

1.1 Product identifier

1.1.1 Name of product: Zinc-aluminium-magnesium-coated sheet (ZM)

1.1.2 Additional identification: ZM Ecoprotect®

1.2 Relevant identified uses of the product and uses advised against

1.2.1 Relevant identified uses: Further processing of the steel product.

1.2.2 Uses advised against: None known.

1.3 Details of the supplier of the safety information sheet

1.3.1 Supplier (manufacturer): thyssenkrupp Steel Europe AG

1.3.2 Street: Kaiser-Wilhelm-Straße 100

1.3.3 Postal code/city: D 47166 Duisburg

1.3.4 Country: Germany

1.3.5 Telephone: +49 203 / 52-0

1.3.6 Telefax: +49 203 / 52 25 10 2

1.3.7 Informing department: TEM-EEM-G&S

1.3.8 E-mail (competent person): sicherheitsdatenblaetter-tks@thyssenkrupp-steel.com

1.4 Emergency telephone number: +49 203 / 52 41 21 1 (24 h/d available)

2 Hazards identification

2.1 Classification of the product: The alloy (preparation) this article is made of is not classified as dangerous in the meaning of the European Regulation (EC) No 1272/2008 (CLP).

2.2 Other hazards: During thermal or mechanical treatment (i.e. welding, detaching, grinding) dust and fume may appear and the principal risk to human health is related to the concentration of dust in the air (see occupational exposure limits chapter 8.1.1).

According to our current state of knowledge the product has no endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

According to our current state of knowledge the product is free of persistent organic pollutants according to regulation (EU) 2019/1021.

3 Composition/information on ingredients

3.1 Chemical characterisation: Carbon or low alloy, coated steel.

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3.2 Ingredients of steel:

EINECS Registration no.	CAS-No.	Name	Concentration [%] (EC) No 1272/2008	Classification
231-096-4 01-2119462838-24	7439-89-6	Iron	> 95	-

3.3 Ingredients of coating:

EINECS Registration no.	CAS-No.	Name	Concentration [%] (EC) No 1272/2008	Classification
231-175-3 01-2119467174-37	7440-66-6	Zinc	≥ 95	-
231-104-6 01-2119537203-49	7439-95-4	Magnesium	≤ 2	-
231-072-3 01-2119529243-45	7429-90-5	Aluminium	≤ 2	-

3.4 Material composition:

Sheets made of steel

Surface refinement:

-ZM ecoprotect: alloy coating up to 430 g/m².

On customer request oiled with corrosion protection.

3.5 Further information:

The product fulfils the requirements according to Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS-II). The product fulfils the requirements according to Directive 2000/53/EC on the restriction of the use of certain hazardous substances (End of Life Vehicles Directive). According to our current state of knowledge no substances of the GADSL-list are present in the product above the concentration limits. According to our current state of knowledge no substances are present in our products above 0.1% (w/w) which fulfil the criteria according to article 57 and 59(1) of the REACH- Regulation or are listed in the candidate list according to Annex XIV. We will inform our customers immediately in case any changes occur regarding this issue.

4 First aid measures

4.1 General information:

First-aid measures refer to dust and fume which may result from thermal or mechanical treatment.

4.2 In case of inhalation:

Move affected person into fresh air. Seek medical advice if appropriate.

4.3 In case of skin contact:

Wash off thoroughly with soap and water.

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| 4.4 | In case of eye contact: | Rinse the eyes thoroughly with water with the eyelids open. Seek medical advice if an irritation persists. |
| 4.5 | In case of ingestion: | Rinse mouth and drink plenty of water. |

5 Firefighting measures

5.1 Extinguishing media

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|-------|-------------------------------|---|
| 5.1.1 | Suitable extinguishing media: | Foam (alcohol-resistant), carbon dioxide-powder, spray (water). Steel (massive) does not burn. Co-ordinate fire-fighting measures to the fire surroundings. |
|-------|-------------------------------|---|

- | | | |
|-------|---------------------------------|-------------|
| 5.1.2 | Unsuitable extinguishing media: | None known. |
|-------|---------------------------------|-------------|

- | | | |
|-----|--|-------------|
| 5.2 | Special hazards arising from the product: | None known. |
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- | | | |
|-----|---------------------------------|-------|
| 5.3 | Advice for firefighters: | None. |
|-----|---------------------------------|-------|

6 Accidental release measures

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|-----|---|--|
| 6.1 | Personal precautions, protective equipment and emergency procedures: | Steel products may have sharp edges, therefore use cut resistant gloves. |
| 6.2 | Environmental precautions: | No special environmental measures are necessary. |
| 6.3 | Methods and material for containment and cleaning up: | Take up mechanically, use low-dusting cleaning methods. |
| 6.4 | Reference to other sections: | Disposal: see section 13
Personal protection equipment: see section 8 |

7 Handling and storage

7.1 Precaution for safe handling

- | | | |
|-------|--|--|
| 7.1.1 | Hints for safe handling: | Steel products may have sharp edges, therefore use cut resistant gloves. |
| 7.1.2 | Technical measures: | In case of thermal and/or mechanical processing, local exhaust ventilation has to be used to underrun limit values described in chapter 8.1.1. |
| 7.1.3 | General health and safety measures: | Do not eat, drink, smoke or take snuff while working.
Wash hands before breaks and on finishing work. |
| 7.2 | Conditions for safe storage, including any incompatibilities: | Avoid contact with acids (release of hydrogen by contact with the pure metal possible). |

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8 Exposure controls / personal protection

8.1 Control parameters

8.1.1 Occupational exposure limits (OELs):

CAS-No.	name	ml/m ³	mg/m ³	upper limit
	dust, alveolar fraction (A)		1.25	
	dust, respirable fraction (E)		10	2(II)

8.1.2 Additional hints on exposure limits:

Source (German legislation): TRGS 900 "Arbeitsplatzgrenzwerte"
Values refer to dust and fume that may result during treatment.

8.1.3 DNEL/DMEL and PNEC values:

Observe in addition the national legislative regulations!
DNEL/PNEC- values are not necessary.
DNELs for Iron General Population from iron-CSR:
Long-term systemic effects (Oral): 0.71mg/kg bw/day
Long-term - local effects (Inhalation): 1.5mg/m³

8.2 Exposure controls

8.2.1 Appropriate engineering controls:

Refer to no. 7. Ordinary technical equipment (e.g. exhaust ventilation) is sufficient for welding.

8.2.2 Respiratory protection:

Not necessary (massive form).
At appearance of dust and exceeding of limit values: breathing filter P2.

8.2.3 Hand protection:

Depends on machining. If necessary use cut resistance gloves (EN 388). For example Kevlar® with liquid-repellent coating (nitrile rubber: repels oils) is suitable (cut resistance level 2 or higher is recommended).

8.2.4 Eye / face protection:

Not necessary (massive form).
At appearance of dust: safety glasses.

8.2.5 Suitable protective clothing:

Safety shoes, working clothes.

8.3 Environmental exposure controls:

For metal in massive form no special precautionary measures necessary.

9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

9.1.1 Physical state:

solid

9.1.2 Colour:

silver grey

9.1.3 Odour:

metallic

9.1.4 Melting-point/freezing point:

approx. 1530 °C (steel)
approx. 420 °C (zinc)

(1013 hPa)



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9.1.5	Boiling point or initial boiling point and boiling range:	approx. 2861°C (steel) approx. 908 °C (zinc)	(1013 hPa)
9.1.6	Flammability:	n.a. (massive steel)	
9.1.7	Lower and upper explosion limit:	n.a. (massive steel)	
9.1.8	Flash point:	No test necessary for inorganic steel.	
9.1.9	Auto-ignition temperature:	no auto-ignition	
9.1.10	Decomposition temperature:	n.a. (massive steel)	
9.1.11	pH Value:	n.a.(solid steel)	
9.1.12	Kinematic viscosity:	n.a. according REACH Annex 7 column 2	
9.1.13	Solubility (g/l):	steel is insoluble in water at 22°C.	
9.1.14	Partition coefficient n-octanol/water:	n.a. (massive steel)	
9.1.15	Vapour pressure:	n.a. (massive steel)	
9.1.16	Density and/or relative density:	steel ~ 7.80 g/cm ³	(20°C)
9.1.17	Relative vapour density:	n.a. (massive steel)	
9.2	Other information		
9.2.1	Evaporation rate:	n.a. because melting point above 300°C	
9.2.2	Explosive properties:	Not dust explosive. Does not contain any chemical group associated with explosive properties.	
9.2.3	Oxidising properties:	Not oxidising.	

10 Stability and reactivity

10.1	Reactivity:	Not reactive under normal conditions.
10.2	Chemical stability:	Stable under normal conditions.
10.3	Possibility of hazardous reactions:	No dangerous reaction known.
10.4	Conditions to avoid:	No dangerous condition known.
10.5	Incompatible materials:	Avoid contact with acids and hot alkali-solutions (corrosion), release of hydrogen possible.
10.6	Hazardous decomposition products:	None known.

11 Toxicological information

(1)

11.1	General information:	All given information refer to iron which represents the main proportion (>85%) of the article.
11.2	Information on hazard classes as defined in Regulation (EC) No 1272/2008	
11.2.1	Acute toxicity:	There is no evidence for systemic toxicity. Oral (rat) electrolytic iron powder LD ₅₀ > 7500 mg/kg Inhalative (rat) carbonyl iron LC ₅₀ (powder) (6h) > 250 mg/m ³
11.2.2	Skin corrosion/irritation:	(OECD 404): not irritating

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11.2.3	Serious eye damage /irritation:	(OECD 405): not irritating Mechanical friction may cause irritation.
11.2.4	Respiratory or skin sensitisation:	Not sensitising.
11.2.5	Repeated dose Toxicity:	oral (rat) iron LOAEL: 26mg/kg bw/day Inhalative (rat) iron NOAEC: 5mg/m ³
11.2.6	Germ cell mutagenicity:	No indication of mutagenicity (negative test results for bacteria- and cell culture tests)
11.2.7	Carcinogenicity:	No indication of carcinogenicity.
11.2.8	Reproductive toxicity:	No indication of reproductive toxicity.
11.2.9	STOT-single exposure:	No specific target organ toxicity after single exposure known.
11.2.10	STOT-repeated exposure:	No specific target organ toxicity after repeated exposure known.
11.2.11	Aspiration Hazard:	n.a. (massive steel)
11.2.12	Information on likely routes of exposure:	The likely route of exposure is dermal contact.
11.2.13	Symptoms related to the physical, chemical and toxicological characteristics:	None known.
11.2.14	Delayed and immediate effects as well as chronic effects from short and long-term exposure:	None known.
11.3	Information on other hazards:	None known.

12 Ecological information

(1)

12.1	General information:	All given information refer to iron which represents the main proportion (>85%) of the article.
12.2	Ecotoxicity:	There is no evidence for ecotoxicological impact*. Aquatic, fish short term (Brachydanio rerio) LLO (96h): > 1000 mg/l (iron oxide) *more studies can be found in CSR for iron.
12.3	Persistence and degradability:	Methods for determination of biological degradability is not relevant for inorganic substances.
12.4	Bioaccumulative potential:	n.a.: Iron is an essential substance, well regulated in all living organisms.
12.5	Mobility in soil:	n.a.: Iron oxidises in the environment and is stabilised in the iron(III)-oxide form in the long term.
12.6	Results of PBT and vPvB assessment:	As iron is not bio-available, owing to its extreme insolubility in water, it is not systemically available or bioaccumulative, and hence it does not fulfil either of the PBT and vPvB criteria for classification.
12.7	Other adverse effects:	No negative ecological effects are expected according to the present state of knowledge.

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13 Disposal considerations

13.1 Waste treatment methods

13.1.1 Disposal / waste (product):

Iron and steel should always be recycled.

13.1.2 List of proposed waste codes/waste designations in accordance with EWC:

Waste classification due to trade and processing. During machining fillings or dust can be generated. For those following waste EWC-code numbers can be recommended:
120101 ferrous metal filings and turnings or
120102 ferrous metal dust and particles.

13.2 Disposal packages:

n.a.

14 Transport information

14.1 Land transport (ADR/RID/CDG Road/CDG Rail): No hazardous material as defined by transport regulations.

14.2 Inland waterway craft (ADN/ADNR): No hazardous material as defined by transport regulations.

14.3 Marine transport (IMO): No hazardous material as defined by transport regulations.

15 Regulatory information

15.1 Safety, health and environmental EU regulations/legislation specific for the product

15.1.1 Directive 2004/42/EC: VOC-solvent emission: 0 %

15.1.2 Directive 2012/19/EU: The product fulfils the directive „WEEE“ – Waste Electrical and Electronic Equipment.

15.1.3 Directive 2011/65/EU: The product fulfils the requirements on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

15.1.4 Directive 2000/53/EC: The product fulfils the requirements on the End of Life Vehicles Directive (ELV).

15.1.5 Directive 2012/18/EU (Seveso III): The product is not classified according to the regulation.

15.2 National law: Observe in addition the national legislative regulations!

15.3 Chemical safety assessment: A chemical safety assessment is not necessary for this article.

16 Other information

16.1 Documentation of changes: First edition!

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16.2 Further information:

abbreviations:

n.a. = not applicable

DNEL = derived no effect level

PNEC = predicted no effect concentration

LL₀= "Lethal Loading" max concentration of a hardly soluble substance which leads to none mortality in the test system.

STOT= specific target organ toxicity

16.3 References:

⁽¹⁾ CSR: Chemical Safety Report Iron according to Regulation (EC) No 1907/2006 (REACH)

Statement:

This information sheet is based on our present stage of knowledge. It does not, however, give assurances of product properties and establishes no contract legal rights.

The product is to be used exclusively for the applications named in the technical leaflet or in the processing instructions. The receiver of our product is singularly responsible for adhering to existing laws and regulations.