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

1.1 Product identifier:

Product name: Zinc alloys

Synonyms:

Zinc alloy	Other synonyms		
ZnAl0.2–1.1	CGG 0.2–1.1		
ZnAl0.4Mg2.5	ZnMg2.5		
ZnAl3Cu5	MAC		
ZnAl3Mg3	ZMA3		
ZnAl4	MAZAK3	ZL3	ZL0400
ZnAl4.5	MAZAK7+	ZL7+	
ZnAl4Cu1	MAZAK5	ZL5	ZL0410
		ZP5	ZP0410
ZnAl4Cu3	KAYEM	ZL2	ZL0430
		ZP2	ZP0430
ZnAl4Cu3Mg05	MCC		
ZnAl4Cu6	MAZAK46		ZL0460
ZnAl5	MA05		ZL0500
ZnAl5Mg3	ZMA5		
ZnAl6Cu1	MAZAK6	ZL6	ZL0610
ZnAl8Cu1	MAZAK8	ZL8	ZL0810
ZnAl10	MA10		
ZnAl11Cu1	MAZAK12	ZL12	ZL1110
ZnAl15	MA15		ZL1500
ZnAl27Cu2	MAZAK27	ZL27	ZL2720
ZnNiBi			

Registration number REACH: Not applicable (mixture)

1.2 Relevant identified usages of the substance or mixture and usages advised against:

Relevant identified usages: Zinc alloys are used in metallurgical industry for die casting, centrifugal casting and steel galvanizing.

Usages advised against: Not being stated.

1.3 Details of the supplier of the material safety data sheet:

Supplier and the person responsible for the placing on the market:

Garda Alloys s.r.o.

Prievozská 4/A, 821 09 Bratislava, Slovensko

tel.: +421-55-673 57 94, fax: +421-55-673 66 29

E-mail address of the respective person responsible for material safety data sheet:
mail@gardaalloys.sk

1.4 Emergency telephone: National toxicological centre

+421-(0)2-547 741 66

24-hour consultation service for acute intoxications

SECTION 2: HAZARD IDENTIFICATION

2.1 Classification of the substance or mixture: Not classified as dangerous according to criteria of Regulation (EC) No. 1272/2008, Law no. 67/2010 the conditions referred to chemical substances and mixtures on the market and amendments to the Law (D) and the classification rules in Directives 67/548 / EEC and 1999/45 / EC.

2.2 Classification according to Regulation No. 1272/2008

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

2.3 Other Hazards

By industrial processing of metals, zinc in the air can be coupled with dust particles and the melting process creates radiant heat – risk of burns. In high concentrations vapour from the molten zinc and oxide dust may cause "metal fume fever".

By industrial processing of metals, zinc in the air coupled with dust particles can be transferred by rain into surface and ground water. It accumulates in the bodies of fish and other water organisms except water flora. Inadequate preventive actions can cause environment contamination. Avoid leaking into environment.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances: Not applicable.

3.2 Mixture:

Name of substance REACH Registration No	CAS number EC number	Concentration (%)	Classification according to CLP	Remarks
zinc [2] 01-2119467174-37-XXXX	7440-66-6 231-175-3	69,3 – 99,85		UVCB component
aluminium [2] 01-2119529243-45-XXXX	7429-90-5 231-072-3	0,15 – 28		UVCB component
copper [2] 01-2119480154-42-XXXX	7440-50-8 231-159-6	0 – 6,3		UVCB component
magnesium [1, 10] 01-2119537203-49-XXXX	7439-95-4 231-104-6	0 – 3,3	Flam. Sol 1, H228 Water-react. 2, H261 Self-heat. 1, H251	UVCB component

[1] For H-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: Zinc alloys in their metallic form do not mean direct risk for human health. See the doctor in case of any health troubles or doubt regarding your health, and provide him/her with the data from this material safety data sheet.

After inhalation: When treated (by heating or abrasion), it may give off zinc oxide or zinc dust. Inhalation of zinc oxide or zinc fumes may cause "metal fume fever". Secure supply of fresh air to the patient. Keep the patient at warm and rest. If respiratory difficulties persist seek the doctor.

After skin contact: After burning, cool with water immediately and seek the doctor immediately. Metallic zinc has not been shown to cause hazards through skin contact. Skin that has been subject to zinc dust and zinc compounds must be washed with soap and water. A person with skin lesions must see a doctor.

After eye contact: After burning, cool with water stream and seek the doctor immediately. If a chip or splash of molten metal goes into the eye, the patient must be taken to a doctor immediately.

After swallowing: Swallowing is not expected. A person who has ingested any zinc compound must be given water to drink and be taken to a doctor immediately.

4.2 Most important symptoms and effects, both acute and delayed: Not applicable.

4.3 Indication of any immediate medical attention and special treatment needed: Not applicable.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing media:

Appropriate extinguishing media: depending on fire surroundings use sand in case of molten metal.

Inappropriate extinguishing media: water – in case of molten metal.

5.2 Special hazards arising from the substance or mixture: Extreme heat and contact with direct flame may cause poisonous or irritant particles origination. Splashes of molten metal to unprotected skin will cause burns.

5.3 Advice for fire-fighters: Compressed-air breathing apparatus. In case of molten metal – a safety helmet with a shield, fireproof protective clothing, protective gloves and safety footwear. Use the prescribed safety protection wear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

6.1.1. **Protective equipment for non-emergency personnel:** Use personal protective work wear. Follow the instructions stated in sections 7 and 8.

6.1.2. **Protective equipment for emergency personnel:** Not applicable.

6.2 Environmental precautions: Do not allow leakage into drains, groundwater, surface water and soil.

6.3 Methods and material for containment and cleaning up: Collect the metal mechanically. In case of molten metal, cover it with sand or any non-flammable absorptive material. By emission do inform the respective authorities pursuant to the valid regulations i.e. fire-men, District Office of Environment, etc.

6.4 Reference to other section: Dispose according to the section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling: Use personal protective work wear according to the section 8. Follow the health and safety precautions at work according to the valid regulations. Do not drink and smoke at work. Prevent emission of the substance into the environment.

7.2 Conditions for safe storage, including any incompatibilities: Prevent the substance from contact with acids, alkalis and their vapours. Store in dry place. Keep out of the reach of children.

7.3 Specific end use(s): Not applicable.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters:

8.1.1 Occupational exposure:

The highest acceptable exposure limits (NPEL) pursuant to Annex No.1 of the statutory order No. 355/2006 coll. on employees' protection against risk related to exposure to chemical factor at work for the stated chemical substances:

Chemical substance	EC number	NPEL				Remark
		average		Short - time		
		ml/m^3	mg/m^3	Category	mg/m^3	
Zinc	231-175-3	- -	- -	- -	- -	
aluminium respirable fraction inhalation fraction	231-072-3	- -	1,5 R 4 I	- -	- -	
copper dust smoke	231-159-6	- -	1 0,1	II II	2 0,2	

NPEL for solid aerosols (dust) is determined as the average value of the exposure to the total concentration of solid (inhalable) aerosol (NPELc) or to its respirable fraction (NPELr) during full work-shift. The exposure value can be valued satisfactory only if both NPEL values for the solid aerosols are not exceeded. In the case of a mixture also NPEL for all particular components at the same time must not be exceeded.
R – means that exposure is measured as respirable fraction of aerosol which may penetrate up to sac alveoli and for which the limit is set.
I – means that exposure is measured as inhalation fraction of aerosol which may be inhaled into airways and for which the limit is set.

8.1.2 DNEL/PNEC values:

DNEL/DMEL – WORKERS

Zinc

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systematic effect - oral	0,83 mg/kg bw/day	
	Long-term systematic effect - dermal	83,3 mg/kg bw/day	
	Long-term systematic effect - inhalation	5 mg/m^3	

Aluminium

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systematic effect - inhalation	3,72 mg/m^3	

Copper

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Acute systematic effect - dermal	273 mg/kg bw/day	
	Acute systematic effect - inhalation	18,2 mg/m^3	
	Long-term systematic effect - dermal	137 mg/kg bw/day	

DNEL/DMEL – GENERAL POPULATION

Zinc

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systematic effect - oral	0,83 mg/kg bw/day	
	Long-term systematic effect - dermal	83 mg/kg bw/day	
	Long-term systematic effect - inhalation	2,5 mg/m^3	

Aluminium

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systematic effect - oral	395 mg/kg bw/day	

Copper

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Acute systematic effect - dermal	273 mg/kg bw/day	
	Acute systematic effect - inhalation	18,2 mg/m^3	
	Long-term systematic effect - dermal	137 mg/kg bw/day	
	Long-term systematic effect - oral	0,16 mg/kg bw/day	

PNEC

Zinc

Compartments	Value	Remark
Fresh water	20,6 µg/l	
Sea water	6,1 µg/l	
Fresh water sediments	117,8 mg/kg sediment dw	
Sea water sediments	56,5 mg/kg sediment dw	
Soil	35,6 mg/kg soil dw	
STP	0,052 mg/l	

Aluminium

Compartments	Value	Remark
Fresh water	74,9 µg/l	
STP	20 mg/l	

Copper

Compartments	Value	Remark
Fresh water	7,8 µg/l	
Sea water	5,2 µg/l	
Fresh water sediments	87 mg/kg sediment dw	
Sea water sediments	676 mg/kg sediment dw	
STP	230 µg/l	
Soil	65 mg/kg soil dw	

8.2 Exposure controls: Selection and usage of personal protective equipment depends on the implementation of industrial activity with the alloy.

8.2.1. Appropriate engineering controls: Not applicable.

8.2.2. Individual protection measures, such as personal protective equipment:

8.2.2.1. Eye/face protection: Wear protective goggles or face shield.

8.2.2.2. Skin protection: Wear working protective clothing and gloves. At work with molten zinc it is recommended to use heat-resistant PPE.

8.2.2.3. Respiratory protection: Ensure adequate exhaust ventilation at the workplace. Protect airways using a suitable respiratory protection.

8.2.2.4. Thermal hazards: Not applicable.

8.2.3. Environmental exposure controls: Avoid leakage to the environment.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 General information:

Appearance:	Silver-gray solid metal
Odour:	Odourless
Odour threshold:	Not applicable
pH:	Not applicable
Melting point:	420 °C (Zn)
Boiling point:	907 °C (Zn)
Flash point:	Not applicable
Evaporation rate:	No data available
Flammability (solid, gas)	zinc in its solid form is not combustible
Upper/lower flammability or explosion:	Not applicable
Vapour pressure:	31 Pa for 450 °C (Zn)
Vapour density:	No data available
Relative density:	7,14 g/cm^3 for 20 °C (Zn)
Solubility:	No data available
Partition coefficient: n-octanol/water	Not applicable
Auto-ignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	No data available
Explosive properties:	No chemical group associated with explosive properties
Oxidising properties:	No chemical group associated with oxidising properties

9.2 Other information:

Other:	Product dissolves in acids, alkalis and acetic acid. Hydrogen gas is given off as a reaction product.

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: Not applicable.

10.4 Conditions to avoid: Protect from humidity. Also see section 7 and 9. If zinc ingots contain humidity when fed into the smelter, it may cause splashes of molten metal or explosion.

10.5 Incompatible materials: Acids, alkalis.

10.6 Hazardous decomposition products: Extreme heat and contact with direct flame may cause poisonous or irritant particles origination. Solid zinc reacts with acids and alkalis giving off hydrogen gas, as reaction product, which is flammable, explosive, odourless and lighter than air.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:

Zinc belongs to micronutrients; it accumulates in all tissues of organism. Already by low concentrations it may cause damage of human health. Recommend daily dose of zinc in food (RDA) is 15mg per day; for female 12mg per day; for children 10mg per day and for suckling babies 5mg/day.

Negative impacts of zinc to human health starts from 10-15 multiple exceed of recommend dose (RDA) and spread is 100-250 mg per day. Intake of high quantity of zinc at short exposition causes stomach pains and vomiting and from long time perspective it causes anaemia, damages density lipoprotein cholesterol that is necessary for maintaining the level of cholesterol in human body.
Inhalation of large mass of zinc in form of dust elements and smoke causes specific diseases known under name of “metal fume fever”.
Aluminium belongs to micronutrients; it accumulates most of all in pancreas. For human it shows very low toxicity. Despite that, recently a trivalent ion of aluminium $A1^{+++}$ has been found as a suspect to cause genotoxicity. In case of disadrenia (kidneys malfunction) (haemodialysis) it is neurotoxical, its secretion out of body is stopped – kidneys malfunction. The main poisoning manifestation is speech disorder, dementia known as Alzheimer disease and seizures. Also osteomalation occurs. Inhalation of very fine dust causes disease known as “aluminiosis”, which is demonstrated as a dry cough, same lungs troubles as at silicosis, however, lymphatic ganglia are not harmed .

11.2 Subchronical - chronical toxicity: No data available.

11.3 Senzitization: No data available.

11.4 Carcinogenicity: No data available.

11.5 Mutagenicity: Is not proved.

11.6 Reproductive toxicity: Is not settled.

11.7 Impact on human being: The substance is not dangerous at normal manipulation. Long-time exposition to skin and inhalation must be prevented.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity: No data available.

12.2 Persistence and degradability: Not applicable.

12.3 Bioaccumulative potential: No data available.

12.4 Mobility in soil: No data available.

12.5 Results of PBT and vPvB assessment: Not applicable.

12.6 Other adverse effects: Not applicable.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods: Dispose the substance in accordance with the national legislation. It is possible to recycle zinc alloys. Waste holder is obliged to range according to Waste catalogue.

SECTION 14: TRANSPORT INFORMATION

Transport is performed by common means of transport (a truck, wagon), there are no special permits necessary (ADR).

14.1 OSN No.: Not applicable.

14.2 OSN proper shipping name: Not applicable.

14.3 Transport hazard class: Not applicable.

14.4 Packing group: Not applicable.

14.5 Environmental hazards: Not applicable.

14.6 Special precautions for user: Not applicable.

Transport in bulk to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulation/legislation specific for substance or mixture: A mixture neither substance containing mixtures are not subject to authorization under Chapter VII, and not subject to restriction under Title VIII of the European Parliament and Council Regulation (EC) No. 1907/2006.

Regulation of the European Parliament and Council (EC) No. 1272/2008 of 16th December 2008 on classification, labelling and packaging of substance and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC and amending Regulation (EC) No. 1907/2006;

Commission Regulation (EU) No.453/2010 of 20th May 2010 amending Council Regulation of the European Parliament and Council Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorisation and restriction of Chemicals (REACH) ;

Corrigendum to Directive of the European parliament and of the Council (ES) No. 1907/2006 of 18th December 2006 defining and laying down the registration, evaluation, authorization and limitation of chemicals (REACH) and on origination of the European chemical agency, and on alteration and amendment of regulation 1999/45/ES and on withdrawal of order of Council (EHS) No. 793/93 and statue of the Commission (ES) No. 1488/94, regulation of the Council 76/769/EHS and regulations of the Commission 91/155/EHS, 93/67/EHS, 93/105/ES and 2000/21/ES;

15.2 Chemical safety assessment: No chemical safety assessment is required.

SECTION 16: OTHER INFORMATION

Full text of any H-statements, referred to under headings 2 and 3:

H228 Flammable solid

H251 Self-heating: may catch fire

H261 In contact with water releases flammable gases

Training advice: Not applicable.

Recommended restriction on use: Not applicable.

PBT-substances = persistent, bio accumulative and toxic substances

CLP (EU-GHS) Classification, labelling and packaging (Globally Harmonised System in Europe)

Purpose of the safety data card: The aim of the safety data card is to enable the users to take necessary precautions concerning health protection and safety on workplace, as well as environment protection. The data provided correspond with the actual state of knowledge and experience and are in accordance with valid regulations. They cannot be considered as a warranty of fitness and applicability for respective application.

Key data sources: The content of the safety data card complies with the requirements of the Annex II of European Parliament and Council Directive (EC) no. 1907/2006. Classification was carried out under European Parliament and Council Regulation (EC) No.1272/2008. Material safety data sheet was elaborated on a basis of information about the substance / mixture provided by the company Garda Alloys, s.r.o.