

Safety Data Sheet

According To Regulation (EC) No 1907/2006 (REACH)


CHLORINE

 Version: 1.0
 Form No: 193163

 Preparation Date: 4/27/2020
 Revision Date: 4/27/2020

1. IDENTIFICATION OF THE PRODUCT AND OF THE COMPANY/UNDERTAKING

1.1 Product Identifier

Product Name	CHLORINE
SDS¹ No	193245
CAS² No	7782-50-5
EINECS³ No	231-959-5
Chemical Name	Chlorine
Chemical Formula	Cl ₂
Structural Formula	

1.2 Relevant Identified Uses Of The Product And Uses Advised Against

Relevant Identified Uses	It is used in water treatment, plastic industry, cleaning products production and chemical industry.
Uses Advised Against	See chapter 16 for a general overview

1.3 Details Of The Supplier Of The Safety Data Sheet

Supplier (Manufacturer)	AK-KİM KİMYA SAN. VE TİC. A.Ş.
Address – Factory	Merkez Mahallesi, Ak-Kim Sokak, No:7 Taşköprü, Çiftlikköy / TÜRKİYE www.akkim.com.tr
Telephone	0 226 815 33 00
Fax	0 226 353 25 39

1.4 Information Providing Authority About Safety Data Sheet

Ali Haydar KETİR
 ali.ketir@akkim.com.tr

1.5 Emergency Telephone Number

Company Emergency	0 226 815 33 00
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2. HAZARDS IDENTIFICATION

2.1 Classification Of The Product

2.1.1 Classification According to Regulation (EC) No 1272/2008

- Ox. Gas 1; H270
- Skin Irrit.2; H315
- Eye irritation, Category 2; H319
- Acute Tox. 3; H331
- STOT SE 3; H335
- Aquatic Acute 1; H400

2.2 Label elements

2.2.1. Labeling According to Regulation (EC) No 1272/2008 [CLP⁴/GHS⁵]

Product Identifier
Hazard Component for Labeling
· Chlorine (>99,9%)

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Hazard Pictograms



Signal Word

· DANGER

Hazard Statements

H270 May cause or intensify fire; oxidiser.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H331 Toxic if inhaled.

H335 May cause respiratory irritation.

H400 Very toxic to aquatic life.

Precautionary Statements

General

P101 If medical advice is needed, have product container or label at hand.

Prevention

P220 Keep/Store away from clothing/.../combustible materials.

P261 Avoid breathing dust/fume/gas/mist/vapours/ spray.

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response

P302+P352 IF ON SKIN: Wash with plenty of soap and water.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P311 Call NATIONAL POISON CENTER's number 114 or a physician.

P337+P313 If eye irritation persists: Get medical advice/ attention.

Storage

· None

Disposal

P501 Dispose of contents / container in accordance with local / regional / national / international regulations.

Supplemental Hazard Information (EU) Statements

· None

2.2.2. Special Rules For Supplemental Label Elements For Certain Mixtures

· None.

2.2.3. Additional Labeling

· Not Applicable

2.3 Hazard Identification

2.3.1. Skin Contact

Causes skin irritation.

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2.3.2. Eye Contact

Causes serious eye irritation.

2.3.3. Ingestion

No data available

2.3.4. Inhalation

Toxic if inhaled. May cause respiratory irritation.

2.3.5. Long term effects

May cause or intensify fire; oxidiser.

2.3.6. Adverse Environmental Effects

Very toxic to aquatic life.

2.4. Additional Information

· None

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Description Of The Substance:

NAME	EINECS NO	CAS NO.	CONTENT (%)	CLASSIFICATION
				CLP
Chlorine	231-959-5	7782-50-5	>99,9	Ox. Gas 1; H270 Skin Irrit.2; H315 Eye irritation, Category 2; H319 Acute Tox. 3; H331 STOT SE 3; H335 Aquatic Acute 1; H400

3.2 Additional information

· None

4. FIRST AID MEASURES

4.1 Description of first aid measures

4.1.1 General information

· In case of emergency, seek medical advice by showing this safety data sheet.

4.1.2 Following inhalation

· Remove patient to fresh air, check breathing and heart rate.
· If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a doctor immediately. The physician must perform the intervention under clinical conditions, keeping the symptoms under control. There is no reaction to poisoning. Bronchodilators should be used to treat some symptoms. Patients exposed to excessive chlorine should be supervised for a period of time due to late effects.

4.1.3 Following skin contact

· Flush with water for at least 20 minutes.
· Remove contaminated clothing immediately.
· Check for combustion with liquid chlorine. Call a doctor.

4.1.4 Following eye contact

· Rinse with lukewarm running water for at least 15 minutes holding eyelids open. Call a doctor immediately.

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4.1.5 Following ingestion

- For gas ingestion is not the case.

4.1.6 Self-protection of the first aider

- Pay attention to self-protection

4.1.7 Notes for the doctor

- Bronchodilators should be used to treat some symptoms.
- Patients exposed to excessive chlorine should be supervised for a period of time due to late effects.

5. FIRE-FIGHTING MEASURES

5.1 General Information and Flammable Properties

- The product is not flammable.
- Use water mist to cool the chlorine cylinders and to keep their vapors.

5.2 Extinguishing media:

- Water mist, CO₂, dry chemical powder, foam

5.3 Unsuitable extinguishing media

- None known.

5.4 Special hazards arising from the product

- It is not flammable in the air. Hazardous combustion products form chlorides.
- Explosion Related Damages: Reacts violently with most substances explosive and violent.

5.5 Advice for fire-fighters

- In case of firefighting personnel, wear respiratory protection and chemical protective clothing.
- Personnel in the event of firefighting should wear positive pressure full face masks, breathing apparatus and chemical protective clothing.
- Wear protective gloves and clothing.
- Cool tanks and product packaging with water spray.
- Cool portable packaging to safe environment.

5.6 Additional information

- Cool the packages in the fireplace with water.
- Move personnel to safe area.
- Avoid contaminating the environment by using excess extinguisher.
- Fire-fighting residues must not be allowed to reach sewers and groundwater

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

For Emergency Responders:

- Wear protective clothing, chemical protective clothing, full face mask, positive pressure breathing apparatus.
- Leave the area contaminated with chlorine. Prohibit entry. Personnel should be trained in control measures. A chlorine institute emergency response kit should be available to combat chlorine leaks. The holes in the lines or valves are determined by ammonia

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vapor. Chlorine gas is heavier than air and collapses on the ground. Move away in the direction of the wind so that the runaway stays behind you.

- Make sure that personnel thoroughly read and understand all safety precautions.

Non-Emergency Responders:

- Avoid contact with substance. Wear personal protective equipment.
- Make sure the environment is well ventilated. Avoid contact with eyes and skin. See section eight of this form.
- Consult an expert for emergency procedures.
- Do not touch or touch the product until all safety precautions have been read and understood.

6.2 Environmental precautions

- Water mist may be useful to reduce and precipitate chlorine gas emitted to the environment.
- No water should be trapped at the leak point; formed hypochlorous acid, increases leakage.
- Improper spillage may cause soil and water contamination.
- Do not allow to enter sewers / surface or ground water.
- In case of entering into water or sewage system, inform authorities.

6.3 Methods and material for containment and cleaning up

6.3.1 For containment

- Follow local regulations. Place contaminated material in a suitable container and dispose of in accordance with section 13.

6.3.2 For cleaning up

- It can be absorbed and neutralized with chlorine, soda solution, caustic soda solution and aqueous lime.
- Comply with current regulations for waste disposal, handling and reporting of all types. Follow local regulations. Place contaminated material in a suitable container and dispose of in accordance with section 13.

6.3.3 Other information

- Stop leak if possible. Ventilate affected area.

6.4 Reference to other sections

- See section 7 for information on safe handling.
- See Section 8 for information on personal protective equipment.
- See section 13 for information on disposal.

7. HANDLING AND STORAGE

7.1.1 Precautions for safe handling

7.1.2 Protective measures

Personal preventions

- Take precautions to prevent or control both fire and aerosol and dust formation to ensure safe handling of the substance or mixture.
- Wear protective clothing and avoid contact with clothing.
- Special Rules for Manual Transport
- Avoid direct contact with the substance. Wear personal protective equipment.

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- *Make sure the environment is well ventilated. Avoid contact with eyes and skin.*
- *Advice for protection against fire and explosion:*
- *Do not approach sources of ignition or smoke.*
- *Keep firefighting equipment ready.*

Fire preventions

- *The product is not flammable.*

Environmental precautions:

- *Do not allow to enter sewers / surface or ground water.*
- *In case of entering into water or sewage system, inform the competent authorities and inform the authorities.*

7.1.3 Advice on general occupational hygiene

- *Industrial hygiene standards must be followed to avoid ingestion, contact with eyes and skin during use of chemicals.*
- *Wash hands thoroughly with soap and water after handling.*
- *Ensure good ventilation at work.*
- *Smoking, eating and drinking should be prohibited in the application area.*
- *Contaminated clothing and protective equipment should be removed before entering dining areas.*

7.2 Conditions for safe storage, including any incompatibilities

- *When gas is used, ensure that the valves on the gas cylinders are fully opened.*
- *Use the widest possible and adequately ventilated area. Keep pipes clean and dry.*
- *Due to the high expansion coefficient of chlorine, suitable expansion chambers should be placed between the block valves in the liquid chlorine lines.*
- **STORAGE INCOMPATIBILITY**
- *Liquid hydrocarbons, fine powder aluminum, bronze, copper, manganese, tin, steel and iron chloride, ammonia and other nitrogen compounds.*

7.1 Advice on common storage

- *Keep away from food, drink and animal feeding areas.*
- *Keep away from sources of open fire, sparks and heat.*
- *Follow the general rules for storing chemicals.*

7.2 Specific precautions on storage

- *Store in dry, well-ventilated areas away from heat, flames, sparks and easily oxidizable materials.*
- *Keep the full and empty cylinders in the up position.*
- *Cylinder temperatures should never exceed 51 ° C. Do not leave under direct sunlight for a long time. Store the substance in its original packaging.*
- *Smoking, eating and drinking should be prohibited in the environment.*
- *The tank must be dry and cool.*
- *Ensure good ventilation. The tank should be cleaned regularly and the ventilation, temperature and humidity controls should be done regularly.*
- *All items should be kept sealed in their original packaging when not in use.*

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational exposure limits

Chlorine:

- TWA 8 hours
- 1,5 mg/m³
- 0,5 ppm

8.2 Exposure controls

8.2.1 Appropriate engineering controls:

- Carry out work that will allow workers from the substance or mixture to carry out a risk assessment of their safety and health.
- Make sure that the work environment is well ventilated and cleaned to avoid the risk of the product exceeding occupational exposure limits.
- If necessary, install the air filtration system in accordance with NIOSH and CEN systems.
- Design the area of use to prevent contamination of the product.
- See Section 7.

8.2.2 Personal protection equipment

- Use only in well-ventilated areas. Keep away from foodstuffs, beverages and animal feed.
- Remove contaminated, soiled clothing immediately.
- Wash hands at the end of work and after work break.
- Avoid direct contact with eyes and skin.
- Do not eat or drink any food while using this material. Do not smoke.

8.2.2.1 Eye / Face protection:

- Wear goggles and face protection without ventilation.
- Wear full face masks according to recommended levels.
- Do not use contact lenses.



8.2.2.2 Skin protection

Hand protection

- Wear tight, neoprene, PVC or rubber gloves.



Body protection

- Wear chlorine-resistant protective clothing.



Other protection

- Handle in accordance with good industrial hygiene and safety practice.

8.2.2.3 Respiratory protection

- Up to 5 ppm: Half face mask with chlorine-protected cartridge
- Up to 12.5 ppm: Full face mask with canister protecting against chlorine
- Up to 25 ppm: full face protected oxygen mask
- Air tube mask at 30 ppm or unknown concentration and in high risk areas



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8.2.3 Environmental exposure controls

- Provisions under the existing legislation on environmental protection should be fully fulfilled.
- Prohibit entry into the area until cleaning is completed.
- If possible, avoid leakage and ventilate the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Appearance

Form/Physical state	Gas
Color	Yellow
Odor	Characteristic pungent odor
	Value
pH (200 g/l) @ (20°C)	Not applicable
Melting/Freezing point/range (°C)	No data
Boiling point/range (°C) 1,013 hPa	-34,5
Flash Point (°C) Closed cup	Not applicable
Auto Ignition temperature (°C)	Not applicable
Viscosity cSt @ 40 °C	0,385
Relative Density g/cm ³ @ 25 °C	2,45
Vapour Density (kg/m ³) @ 0°C, 1atm	3,123
Oxidizing Properties	Strong oxidizer
Evaporation rate	Very fast
Upper explosion limit % (V)	Not applicable
Lower explosion limit % (V)	Not applicable
Solubility in water g/l @ 20°C	Very low.
Solubility in oil	Very low.
Partition coefficient n-Octanol/Water (log Po/w)	Not applicable
Vapour Pressure (kPa) @ 20°C	666
Other physical and chemical parameters.	When 1 liter of liquid chlorine evaporates, it produces 434 liters of gas chlorine.

Note: The above features were determined according to prescribed methods at the Classification, Packaging and Labeling of Hazardous. Substances Regulation Section A-3 or a method comparable to the other.

10. STABILITY AND REACTIVITY

10.1 Reactivity

- Extremely reactive gas or liquid, substances formed after strong oxidizing reactions can be explosive.

10.2 Chemical stability

- Stable under normal conditions and at normal ambient temperature.

10.3 Possibility of hazardous reactions

- Reacts with water to form hypochlorous acid. Methane, acetylene, ethylene or ethane reacts explosively if ignited by daylight or catalysis. Reacts violently with liquid or solid hydrocarbons (burns or explodes). Fine powder with aluminum, bronze, copper, manganese, tin, steel and iron chlorine; reacts even as explosive. Ammonia and other nitrogen compounds react with chlorine to form highly explosive nitrogen trichloride.

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Phosphorus, boron, activated carbon and silicon can ignite at room temperature in contact with gas chlorine.

10.4 Conditions to avoid:

- Chlorine damages some metal and plastic forms.
- Use only substances approved for chlorine.
- As a result of combustion, dangerous combustion products form chlorides.

10.5 Incompatible materials:

- Water, methane, acetylene, ethylene, ethane, liquid or solid hydrocarbons, fine powder aluminum, bronze, copper, manganese, tin, steel, iron, ammonia, nitrogen compounds, phosphorus, boron, activated carbon, silicon

10.6 Hazardous decomposition products:

- As a result of combustion, dangerous combustion products form chlorides.
- Possibility of hazardous exothermic reactions:
- Reacts violently with liquid or solid hydrocarbons (burns or explodes).
- Fine powder with aluminum, bronze, copper, manganese, tin, steel and iron chlorine; reacts even as explosive.
- In the presence of water vapor, hydrochloric acid and hypochlorous acid may be formed from chlorine. As a result of combustion, dangerous combustion products form chlorides.

10.7 Hazardous polymerization:

- No data

11. TOXICOLOGICAL INFORMATION

11.1 General Information

- This section basically contains information created for use by health professionals, occupational health and safety experts and toxicologists.
- It contains a brief but complete and comprehensible description of the various toxicological (health) effects and the current information used to detect these effects, including toxicokinetics, metabolism and distribution, where appropriate.
- The information in this section is consistent with the classification of the substance or mixture.
- The fields labeled No Information indicate that there is no definite information in the researches.
- Under normal conditions of use, primary exposure occurs through skin, eye and respiratory contact.

11.2 Acute toxicity

Oral:

- No data

Dermal:

- No data

Inhalation:

- LC50
- Species: Mouse
- 293 ppm/1 hour

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11.3 Skin corrosion/irritation and Eye damage/irritation:

Skin:

- Irritant.

Eye:

- Irritant.

Sensitization:

- No information available on respiratory tract or skin sensitization.

11.4 CMR effects (Carcinogenity):

- 29 CFR 1910.1200 (Risk Statement), this product does not contain any carcinogenic substances as listed in NTP15, IARC16 or OSHA17 (This substance is not considered cancerous by the American National toxicology program cancer international research agency or worker health and safety).

11.5 CMR effects (Mutagenicity and Toxicity for reproduction):

- Does not contain mutagenic substances.
- Does not contain toxic substances for reproduction.

11.6 Other Toxicological Effects:

Allergic Effects	There is no known allergic effect. There is no known effects of a stun.
Effects on Repeated Doses Chronic Exposures	Very toxic to aquatic life.
Sensitization	No data
Developmental Toxicity (Teratogenicity)	No data
Fertility	No data

11.7 STOT-single/repeated exposures:

STOT-single exposure	May cause respiratory irritation.
STOT-repeated exposure	No data available

11.8 Symptoms related to the physical, chemical and toxicological characteristics:

In case of inhalation	Toxic if inhaled.
In case of skin contact	Causes skin irritation.
In case of eye contact	Causes serious eye irritation.
In case of ingestion	No data

11.9 Additional Toxicological Information:

- Toxicological classification has been made based on content information and available information.

12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity:

Acute Fish Toxicity:

- LC50 (96 Hours): 0.44 mg / l

Acute Daphnia Toxicity:

- EC50 (96 Hours): 0.49 mg / l

Acute Algae Toxicity:

- IC50 (72 Hours): No data

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12.2 Photo degradation

No data

12.3 Effects on Wastewater Treatment Plants

The product; Since there is no information about whether it has a suppressing effect on the activities of micro-organisms, the potential impact on wastewater treatment plants is unknown.

12.4 Mobility

Gas.

Hardly soluble in water.

When determining environmental mobility, consider the chemical and physical properties of the product. (See Chapter 9)

Water threat class	No data available
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Clean Water Impact	No data available
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Known or predicted environmental distribution	No data available
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12.5 Results of PBT and vPvB assessment

Biotic	
Ready biodegradability:	No data available
Abiotic:	
Hydrolysis as a function of pH:	No data available
Photolysis:	No data available
Atmospheric oxidation:	No data available

· **Persistence and degradability:**

Decomposition Potential of the products	No data available
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The half-life of degradation	No data available
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Potential degradation of product content in the evaluation of wastewater treatment plants	No data available
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· **Bioaccumulation Potential:**

Biological environment (biota) accumulation potential	No data available
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Potential - nutrients pass through	No data available
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Reference Values - Log Kow , Sw and BCF	No data available
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12.6 Additional information

Do not allow to be released into the environment, see Sections 6, 7, 13, 14 and 15 for information on accidental release to the environment, transport and waste disposal.

13. DISPOSAL CONSIDERATIONS

13.1 Product / Packaging disposal

- Incinerate absorbed material at a licensed facility.
- Waste and used packaging must be disposed of in accordance with relevant regulations.
- Do not allow to enter surface and ground water, drinking water supplies, still and running water, or sewage. The gas can be absorbed in chlorine sodium hydroxide or lime solution. Before disposal into the solution, a reducing agent such as sodium sulfite must be treated because hypochlorite is formed. Do not immerse cylinders in caustic solution.

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13.2 Contaminated packaging

- If there is product residue in the emptied container, follow directions for handling on the container's label.
- Contaminated packaging must be emptied of all residues and can be recycled following appropriate cleaning.

13.3 Disposal Methods













- The product must be disposed of in accordance with official regulations.
- Do not allow the product to be disposed of with household waste.
- It is strictly forbidden to mix the product into sewers and groundwater.
- In such cases, inform the authorities.

13.4 European Waste Catalogue

- The final classification has to be done together with the local waste disposal company / authority.

14. TRANSPORT INFORMATION

UN1017 CHLORINE, TOXIC OXIDIZING LIQUID GAS

	ADR ⁶ /RID ⁷	ADNR8	IMDG ⁹	ICAO ¹⁰ /IATA ¹¹
TRANSPORTATION	Road	River	Marine	Airways
PROPER SHIPPING NAME	UN1017 CHLORINE, TOXIC OXIDIZING LIQUID GAS			
UN/ID No.	1017	1017	1017	1017
SYMBOL	  	  	  	  
CLASS	2	2	2	2
PACKAGING GROUP	-	-	-	-
LABELLING NO	2.3+5.1+8	2.3+5.1+8	2.3+5.1+8	2.3+5.1+8
CLASSIFICATION CODE	270C			
HAZARD NO (HIN NO)	265			
TUNNEL RESTRICTION CODE	1 (C/D)			
EmS			F-C; S-U	
MARINE Pollutant			YES	
Road Transport Notes: -				

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15. REGULATORY INFORMATION

15.1 Safety, Health And Environmental Regulations / Legislation Specific For The Substance

Substance is found on the following regulatory lists;

- "European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (English)"

15.2 Chemical Safety Assessment

No data available

15.2.1 HAZARD

CLP classification according to Annex VI of CLP (Regulation (EC) No 1272/2008)

- May cause or intensify fire; oxidiser.
- Causes skin irritation.
- Causes serious eye irritation.
- Toxic if inhaled.
- May cause respiratory irritation.
- Very toxic to aquatic life.

15.2.2 RISK

- May cause respiratory irritation.
- May cause or intensify fire; oxidiser.
- Irritating to eyes

15.3 INTERNATIONAL REGULATIONS

- This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006 and ISO 11014:2009. This product is classified according to EU Directive 67/548/EC and GHS/CLP.

16. OTHER INFORMATION

16.1 Other information

- For additional information regarding AK-KIM KIMYA SAN. VE TIC. A.S. products please contact the AK-KIM KIMYA SAN. VE TIC. A.S
- Ali Haydar KETİR - ali.ketir@akkim.com.tr
- The above information complies with the 199/45/EC and 1907/2006 Directives and their amendments.
- In all cases of potential poisoning supportive therapy is of the utmost importance.

16.2 Related Person

- Prepared by: Mustafa Selçuk BİLGİN (selcuk.bilgin@doruksistem.com.tr)
Competent Person Accreditation no : TSE GBF-A-0-2707 21.12.2017

16.3 Revision Date, Version and SDS no

- Date: April 27, 2020
- Version: 1.0
- MSDS No: 193163

16.4 Reason of re-issue

- Compiling according to Regulation (EC) No 1272/2008

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16.5 Relevant R-, H- and EUH-phrases (number and full text):

H226	Flammable liquid and vapour.
H312	Harmful in contact with skin.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H360D	May damage the unborn child.

16.6 Legal disclaimer

- The purpose of the above information is to describe the products only in terms of health and safety requirements.
- The information given should not, therefore, be construed as guaranteeing specific properties or as specification.
- Customers should satisfy themselves as to the suitability and completeness of such information for their own particular use.
- The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication.
- The above information relates only to the specific material(s) designated herein and may not be valid for such material(s) used in combination with any other materials or in any process or if the material is altered or processed, unless specified in the text.
- The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. Due to the many factors outside our control when using this product, we cannot accept liability for any injury, accident, loss or damage caused through its use.

¹ SDS: Safety Data Sheet

² CAS: Chemical Abstract Service

³ EINECS: European INventory of Existing Commercial

⁴ CLP: Classification Labelling and Packaging

⁵ GHS: Global Harmonised System

⁶ ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

⁷ RID: Regulations Concerning the International Transport of Dangerous Goods by Rail

⁸ ADN: European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways

⁹ IMDG: International Maritime Code for Dangerous Goods

¹⁰ ICAO: International Civil Aviation Organization

¹¹ IATA: International Air Transport Association