SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 6.8
Revision Date 02.07.2024
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GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

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

1.1 Product identifiers

Product name	:	Perchloric acid 60% for analysis EMSURE® ACS
Product Number	:	1.00518
Catalogue No.	:	100518
Brand	:	Millipore
UFI	:	5010-M6VW-K99S-4ETV
REACH No.	:	This product is a mixture. REACH Registration Number see section 3.

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

Identified uses	:	Reagent for analysis, Chemical production

1.3 Details of the supplier of the safety data sheet

Company	:	Merck KGaA Frankfurter Str. 250 D-64271 DARMSTADT
Telephone	:	+49 (0)6151 72-0
Fax	:	+49 6151 727780
E-mail address	:	TechnicalService@merckgroup.com

1.4 Emergency telephone

Emergency Phone #	:	+(44)-870-8200418 (CHEMTREC (GB)) +(353)-19014670 (CHEMTREC Ireland) 001-803-017-9114 (CHEMTREC India)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Oxidizing liquids, (Category 1)	H271: May cause fire or explosion; strong oxidizer.
Corrosive to Metals, (Category 1)	H290: May be corrosive to metals.

Acute toxicity, (Category 4)	H302: Harmful if swallowed.
Skin corrosion, (Sub-category 1A)	H314: Causes severe skin burns and eye damage.
Serious eye damage, (Category 1)	H318: Causes serious eye damage.
Specific target organ toxicity - repeated exposure, (Category 2), Thyroid	H373: May cause damage to organs through prolonged or repeated exposure.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram

Signal Word	Danger
Hazard Statements	
H271	May cause fire or explosion; strong oxidizer.
H290	May be corrosive to metals.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H373	May cause damage to organs (Thyroid) through prolonged or repeated exposure.
Precautionary Statements	
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312	IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with 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.
P314	Get medical advice/ attention if you feel unwell.
Supplemental Hazard Statements	none

Reduced Labeling (<= 125 ml)

Pictogram

Signal Word	Danger
Hazard Statements	
H271	May cause fire or explosion; strong oxidizer.

H314	Causes severe skin burns and eye damage.
Precautionary Statements	
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
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P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Supplemental Hazard Statements	none

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information:
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.
Toxicological information:
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Component		Classification	Concentration
Perchloric acid			
CAS-No. EC-No. Index-No. Registration number	7601-90-3 231-512-4 017-006-00-4 01-2120066865-44-XXXX	Ox. Liq. 1; Met. Corr. 1; Acute Tox. 4; Skin Corr. 1A; Eye Dam. 1; STOT RE 2; H271, H290, H302, H314, H318, H373 Concentration limits: >= 50 %: Skin Corr. 1A, H314; 10 - < 50 %: Skin Corr. 1B, H314; 1 - < 10 %: Skin Irrit. 2, H315; 1 - < 10 %: Eye Irrit. 2, H319; > 50 %: Ox. Liq. 1, H271; <= 50 %: Ox. Liq. 2, H272; 1 - 50 %: Ox. Liq. 2, H272;	>= 50 - < 70 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Hydrogen chloride gas
Not combustible.
Fire may cause evolution of:
Hydrogen chloride gas
Has a fire-promoting effect due to release of oxygen.
Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
No metal containers.
Tightly closed. Separately or together with other oxidising substances only and away from sources of ignition and heat.Because of their oxidation potential these products can raise the burning rate of combustible substances substantially or ignite combustible substances on contact with them.

Recommended storage temperature see product label.

Storage class
Storage class (TRGS 510): 5.1A: Strongly oxidizing hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

8.2 Exposure controls

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: Latex gloves
Minimum layer thickness: 0,6 mm
Break through time: 480 min
Material tested:Lapren® (KCL 706 / Aldrich Z677558, Size M)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Latex gloves
Minimum layer thickness: 0,6 mm
Break through time: 480 min
Material tested:Lapren® (KCL 706 / Aldrich Z677558, Size M)

Body Protection
protective clothing

Respiratory protection
Recommended Filter type: Filter type B

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Physical state	liquid
b)	Color	colorless
c)	Odor	odorless
d)	Melting point/freezing point	No data available
e)	Initial boiling point and boiling range	No data available
f)	Flammability (solid, gas)	No data available
g)	Upper/lower flammability or explosive limits	No data available
h)	Flash point	No data available
i)	Autoignition temperature	No data available
j)	Decomposition temperature	No data available
k)	pH	at 20 °C strongly acid
l)	Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: No data available
m)	Water solubility	at 20 °C soluble
n)	Partition coefficient: n-octanol/water	No data available
o)	Vapor pressure	No data available
p)	Density	1,53 g/cm3 at 15 °C
	Relative density	No data available
q)	Relative vapor density	No data available
r)	Particle characteristics	No data available
s)	Explosive properties	Not classified as explosive.
t)	Oxidizing properties	The substance or mixture is classified as oxidizing with the category 1.

9.2 Other safety information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
Explosive

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Risk of explosion with:
semimetals
Antimony oxide
Metals
Hydrogen
Impurities
organic combustible substances
acetic acid
Halogenated hydrocarbon
Hydrogen halides
Fluorine
Ether
sulfoxides
metallic oxides
Alcohols
acetonitrile
Activated charcoal
Hydrogen chloride gas
ethanol
glycerol
charcoal
carbon/soot
Methanol
dichloromethane
phosphine
Oxides of phosphorus
Rust
Mild steel
Sulfur trioxide
Heat.
dibenzoyl sulfoxide
dibutyl sulfoxide
dimethyl ether
Iron (II) sulfate
Hydrogen fluoride
glycol
glycol ether
phenylacetylene
Wood/Sawdust
dehydrating substances
hypophosphites
oleic acid
Diethyl ether
dimethyl sulfoxide

Iron
ferric oxide
Light metals
Cellulose
antimony
Bismuth
hydrofluoric acid
Acetylene
with
nitrogen oxides
Sulphuric acid
with
Organic Substances
Nitric acid
with
Organic Substances
Lead oxides
with
Heat.
chromium(VI) oxide
with
Heat.
thallium acetate
with
ethylbenzene
Risk of explosion/exothermic reaction with:
Metallic salts
Acetic anhydride
phenol
pyridine
Reducing agents
conc. sulfuric acid
nonmetallic oxides
acetic acid
Organic Substances
ethylbenzene
glycol
hypophosphites
phenols
Sulfur trioxide
Exothermic reaction with:
Ketones
phosphides
Bases
trichloroethene
Risk of ignition or formation of inflammable gases or vapours with:
fats
hydrogen iodide
methylpropene
Acid chlorides
combustible substances
Dithallium trioxide

with
Formaldehyde

10.4 Conditions to avoid
Heating (explosive decomposition).
no information available

10.5 Incompatible materials
Rubber, Light metalsHydrogen may form upon contact with light metals (danger of explosion!).Metals

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Mixture

Acute toxicity
Acute toxicity estimate Oral - 1.834 mg/kg
(Calculation method)
Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.
Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract
Dermal: No data available

Skin corrosion/irritation
Remarks: Mixture causes severe burns.

Serious eye damage/eye irritation
Remarks: Mixture causes serious eye damage.
Risk of blindness!

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Mixture may cause damage to organs through prolonged or repeated exposure.
- Thyroid

Aspiration hazard
No data available

11.2 Additional Information

Endocrine disrupting properties

Product:

Assessment	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

No data available

Components

Perchloric acid

Acute toxicity
LD50 Oral - Rat - 1.100 mg/kg
Remarks: Behavioral:Excitement.
Lungs, Thorax, or Respiration:Dyspnea.
Nutritional and Gross Metabolic:Changes in:Body temperature decrease.
(RTECS)
Acute toxicity estimate Oral - 1.100 mg/kg
(ATE value derived from LD50/LC50 value)
Inhalation: No data available
Dermal: No data available

Skin corrosion/irritation
Remarks: Causes severe burns.
Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Serious eye damage/eye irritation
Remarks: Causes serious eye damage.

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
Test Type: Ames test
Test system: Salmonella typhimurium
Result: negative

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure.
- Thyroid

Aspiration hazard
No data available

SECTION 12: Ecological information

12.1 Toxicity

Mixture

Toxicity to fish	LC100 - Cyprinus carpio (Carp) - 180 mg/l - 24 h

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties

Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Biological effects:
Harmful effect due to pH shift.
Forms corrosive mixtures with water even if diluted.
Discharge into the environment must be avoided.

Components

Perchloric acid

Toxicity to fish	flow-through test EC50 - Lepomis macrochirus (Bluegill sunfish) - 1.470 mg/l - 96 h (US-EPA) Remarks: The value is given in analogy to the following substances: Sodium perchlorate monohydrate
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - > 100 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	static test ErC50 - Pseudokirchneriella subcapitata (green algae) - > 435,7 mg/l - 72 h (OECD Test Guideline 201) Remarks: The value is given in analogy to the following substances: Sodium perchlorate

Toxicity to bacteria	static test EC50 - activated sludge - > 1.000 mg/l - 3 h (ISO 8192) Remarks: The value is given in analogy to the following substances: Sodium perchlorate
Toxicity to fish(Chronic toxicity)	semi-static test NOEC - Danio rerio (zebra fish) - 10 mg/l - 12 Weeks (OECD Test Guideline 215) Remarks: The value is given in analogy to the following substances: Ammonium perchlorate

SECTION 13: Disposal considerations

13.1 Waste treatment methods

No data available

SECTION 14: Transport information

14.1 UN number

ADR/RID: 1873 IMDG: 1873 IATA: 1873

14.2 UN proper shipping name

ADR/RID: PERCHLORIC ACID
IMDG: PERCHLORIC ACID
IATA: Perchloric acid
Passenger Aircraft: Not permitted for transport

14.3 Transport hazard class(es)

ADR/RID: 5.1 (8) IMDG: 5.1 (8) IATA: 5.1 (8)

14.4 Packaging group

ADR/RID: I IMDG: I IATA: I

14.5 Environmental hazards

ADR/RID: no IMDG Marine pollutant: no IATA: no

14.6 Special precautions for user

Tunnel restriction code : (B/E)

Further information : No data available

SECTION 15: Regulatory information

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

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

National legislation

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	P8	OXIDISING LIQUIDS AND SOLIDS

Other regulations

Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out

SECTION 16: Other information

Full text of H-Statements

H271	May cause fire or explosion; strong oxidizer.
H272	May intensify fire; oxidizer.
H290	May be corrosive to metals.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Classification of the mixture		**Classification procedure:**
Ox. Liq.1	H271	Based on product data or assessment
Met. Corr.1	H290	Based on product data or assessment
Acute Tox.4	H302	Calculation method
Skin Corr.1A	H314	Calculation method
Eye Dam.1	H318	Calculation method
STOT RE2	H373	Calculation method

Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent

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