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

1.1. Product identifier

Trade name:
Cooling medium for recooling (Chiller) systems 1:2 Outdoor
Article number: 3301950 / 3301955 / 3301957

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

Application of the substance / the preparation:
Heat transfer fluid
antifreeze

1.3. Details of the supplier of the safety data sheet

Manufacturer/Supplier:
Rittal GmbH & Co. KG
Auf dem Stützelberg
D-35745 Herborn

Informing department:
Department Marketing
Phone: +49 2772 505 9052
E-Mail: info@rittal.de

1.4. Emergency telephone number:
Germany: +49 800 5121 5121 (24 h)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)
Acute toxicity, Category 4
H302: Harmful if swallowed.
Specific target organ toxicity - repeated exposure, Category 2
H373: May cause damage to organs through prolonged or repeated exposure.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)
Hazard pictograms:

Signal word: Warning
Hazard statements:
- H302 Harmful if swallowed.
- H373 May cause damage to organs through prolonged or repeated exposure.

Precautionary statements:
**Prevention:**
- P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
- P264 Wash skin thoroughly after handling.
- P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response:**
- P314 Get medical advice/ attention if you feel unwell.
- P337 + P313 If eye irritation persists: Get medical advice/ attention.

**Disposal:**
- P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Other hazards
No additional hazards are known except those derived from the labelling.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

<table>
<thead>
<tr>
<th>Hazardous components</th>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Registration number</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ethanediol</td>
<td>107-21-1</td>
<td>203-473-3</td>
<td>01-2119456816-28</td>
<td>Acute Tox. 4; H302 STOT RE 2; H373</td>
<td>33 - 37</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>01-2119456816-28-0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>01-2119456816-28-0003</td>
<td></td>
<td>01-2119456816-28-0038</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>01-2119456816-28-XXXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

**General advice**
- Remove/Take off immediately all contaminated clothing.

**If inhaled**
- If inhaled, remove to fresh air.
- Get medical advice/ attention.

**In case of skin contact**
- In case of contact, immediately flush skin with plenty of water.
In case of eye contact: In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

If swallowed: Get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed
Symptoms: No symptoms known currently.
Risks: No hazards known at this time.

4.3 Indication of any immediate medical attention and special treatment needed
Treatment: Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media
Suitable extinguishing media: Not combustible.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2 Special hazards arising from the substance or mixture
Specific hazards during firefighting: In case of fires, hazardous combustion gases are formed:
Carbon monoxide (CO)
Nitrogen oxides (NOx)

5.3 Advice for firefighters
Special protective equipment for firefighters: Self-contained breathing apparatus
Further information: Wear suitable protective equipment.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Personal precautions: Ensure adequate ventilation.
Wear suitable protective equipment.

6.2 Environmental precautions
Environmental precautions: Do not allow to enter drains or waterways

6.3 Methods and material for containment and cleaning up
Methods for cleaning up: Soak up with inert absorbent material (e.g. sand, silica gel,
6.4 Reference to other sections
Information regarding Safe handling, see chapter 7., For personal protection see section 8., For disposal considerations see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Advice on safe handling: Handle and open container with care. Ensure adequate ventilation.
Advice on protection against fire and explosion: Not combustible.
Hygiene measures: Keep away from food and drink.

7.2 Conditions for safe storage, including any incompatibilities
Further information on storage conditions: Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care.
Other data: Storage time: 24 months

7.3 Specific end use(s)
Specific use(s): No further recommendations.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

| Occupational Exposure Limits |
|-------------------------------|-----------------|-----------------|-----------------|
| Components                   | CAS-No.         | Value type (Form of exposure) | Control parameters | Basis     |
| Ethanediol                   | 107-21-1        | TWA                          | 20 ppm             | 2000/39/EC |
|                              |                 |                              | 52 mg/m3           |           |
| Further information          |                 | Identifies the possibility of significant uptake through the skin. Indicative |                 |
|                              |                 | STEL                         | 40 ppm             | 2000/39/EC |
|                              |                 |                              | 104 mg/m3          |           |

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>End Use</th>
<th>Exposure routes</th>
<th>Potential health effects</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanediol</td>
<td>Workers</td>
<td>Dermal</td>
<td>Long-term systemic effects</td>
<td>106 mg/kg bw/day</td>
</tr>
</tbody>
</table>
8.2 Exposure controls

**Personal protective equipment**

Eye protection: Depending on the risk, wear sufficient eye protection (safety glasses with side protection or goggles, and if necessary, face shield.)

Hand protection

<table>
<thead>
<tr>
<th>Break through time</th>
<th>Glove thickness</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>480 min</td>
<td>0.7 mm</td>
<td>Long-term exposure Impervious butyl rubber gloves</td>
</tr>
</tbody>
</table>

Break through time: 30 min

Glove thickness: 0.4 mm


Remarks: These types of protective gloves are offered by various manufacturers. Please note the manufacturers’ detailed statements, especially about the minimum thickness and the minimum breakthrough time. Consider also the particular working conditions under which the gloves are being used.

Respiratory protection: Use respiratory protection in case of insufficient exhaust ventilation or prolonged exposure.

Full mask to standard DIN EN 136

Filter A (organic gases and vapours) to standard DIN EN 141

The use of filter apparatus presupposes that the environment atmosphere contains at least 17% oxygen by volume, and does not exceed the maximum gas concentration, usually
Protective measures: Do not inhale vapours

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: Liquid

Colour: light yellow

Odour: slightly perceptible

Odour Threshold: not tested.

pH: approx. 8
Concentration: 100 g/l (20 °C)
Method: DIN 19268

Melting point: -22 °C
Method: DIN 51583

Boiling point: 106 °C (1.013 hPa)
Method: ASTM D 1120

Flash point: Method: ASTM D6450 (closed cup)
does not flash

Evaporation rate: not tested.

Upper explosion limit: not tested.

Lower explosion limit: not tested.

Combustion number: Not applicable

Vapour pressure: < 0,01 kPa (20 °C)
Method: Calculated by Syracuse.

Relative vapour density: not tested.

Density: 1,0466 g/cm3 (20 °C)
Method: DIN 51757

Bulk density: Not applicable

Water solubility: completely miscible (20 °C)
Solubility in other solvents: not tested.
Solvent: fat

Partition coefficient: n-octanol/water: not tested.

Auto-ignition temperature: Method: DIN 51794
Not applicable for Liquids with Flash Point > 70 °C.

Decomposition temperature: > 250 °C
Method: DSC
Measurement under nitrogen No decomposition up to 250 °C.

Viscosity
Viscosity, dynamic: 2.62 mPa.s (20 °C)
Viscosity, kinematic: 2.5 mm²/s (20 °C)
Method: DIN 51562

Explosive properties: Not explosive
Method: Expert judgement

Oxidizing properties: The substance or mixture is not classified as oxidizing.
Method: Expert judgement

9.2 Other information
Surface tension: Not applicable
Metal corrosion rate: < 6.25 mm/a
Minimum ignition energy: not tested.
Particle size: Not applicable

SECTION 10: Stability and reactivity

10.1 Reactivity
See section 10.3. "Possibility of hazardous reactions"

10.2 Chemical stability
Stable under normal conditions.

10.3 Possibility of hazardous reactions
Hazardous reactions: Incompatible with oxidizing agents.

10.4 Conditions to avoid
Conditions to avoid: None known.

10.5 Incompatible materials
Materials to avoid: not known

10.6 Hazardous decomposition products
When handled and stored appropriately, no dangerous decomposition products are known

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product:
Acute oral toxicity: Remarks: not tested.

Acute toxicity estimate: 1.423 mg/kg
Method: Calculation method

Acute inhalation toxicity: Remarks: not tested.

Acute dermal toxicity: Remarks: not tested.

Components:
Ethanediol:
Acute oral toxicity: LD50 (Rat, male and female): 22.000 mg/kg
Method: Other
GLP: no

Acute inhalation toxicity: LC50 (Rat, male and female): > 2.5 mg/l
Exposure time: 6 h
Method: Other
GLP: yes

Acute dermal toxicity: LD50 (Mouse, male and female): > 3.500 mg/kg
Method: Other
GLP: yes

Skin corrosion/irritation

Product:
Remarks: not tested.

Components:
Ethanediol:
Species: Rabbit
Exposure time: 20 h
Method: BASF test
Result: No skin irritation
GLP: no
Serious eye damage/eye irritation

**Product:**
Remarks: not tested.

**Components:**

**Ethanediol:**
Species: rabbit eye  
Exposure time: 24 h  
Method: BASF test  
Result: non-irritant  
GLP: no

Respiratory or skin sensitisation

**Product:**
Remarks: not tested.

**Components:**

**Ethanediol:**
Test Type: Maximisation Test  
Exposure routes: Skin contact  
Species: Guinea pig  
Method: OECD Test Guideline 406  
Result: Does not cause skin sensitisation.  
GLP: yes

Germ cell mutagenicity

**Product:**
Germ cell mutagenicity-Assessment : No information available.

**Components:**

**Ethanediol:**
Genotoxicity in vitro : Test Type: Ames test  
Species: Salmonella typhimurium  
Concentration: 33 - 5000 μg/plate  
Metabolic activation: with and without  
Method: OECD Test Guideline 471  
Result: negative  
GLP: yes  

: Test Type: Ames test  
Species: Escherichia coli  
Concentration: 33 - 5000 μg/plate  
Metabolic activation: with and without  
Method: OECD Test Guideline 471  
Result: negative
GLP: yes

Genotoxicity in vivo:
- Test Type: Dominant lethal assay
- Species: Rat (male and female)
- Strain: Fischer F344
- Application Route: oral (feed)
- Exposure time: 3 generation
- Dose: 40 - 200 - 1000 mg/kg
- Method: Other
- Result: negative
- GLP: no

Germ cell mutagenicity-Assessment:
- It is concluded that the product is not mutagenic based on evaluation of several mutagenicity tests.

Carcinogenicity
Product:
- Carcinogenicity - Assessment: No information available.

Components:
Ethanediol:
- Carcinogenicity - Assessment: Not classifiable as a human carcinogen.

Reproductive toxicity
Product:
- Reproductive toxicity - Assessment: No information available.

Components:
Ethanediol:
- Effects on fertility
  - Species: Rat
  - Sex: male and female
  - Dose: 40 - 200 - 1000
  - Frequency of Treatment: daily
  - Fischer F344
  - Application Route: oral (feed)
  - Test period: 3 generations
  - NOAEL: > 1.000 mg/kg,
  - F1: > 1.000 mg/kg,
  - F2: > 1.000 mg/kg,
  - Method: Other
  - GLP: no

- Effects on foetal development
  - Species: Rat
  - Application Route: oral (gavage)
Exposure time: gestation day 6-15
Dose: 150 - 500 - 1000 - 2500 mg/kg
Group: yes
500 mg/kg
1.000 mg/kg
Number of exposures: daily
Method: Other
GLP: yes

Reproductive toxicity - Assessment: No reproductive toxicity to be expected.
No teratogenic effects to be expected.

STOT - single exposure
Product:
Remarks: not tested.

Components:
Ethanediol:
Assessment: The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT - repeated exposure
Product:
Remarks: not tested.

Components:
Ethanediol:
Target Organs: Kidney
Assessment: May cause damage to organs through prolonged or repeated exposure.

Repeated dose toxicity
Product:
Remarks: not tested.

Components:
Ethanediol:
Species: Rat, male
NOAEL: 150 mg/kg
Application Route: oral (feed)
Exposure time: 16 w
Number of exposures: daily
Dose: 50 - 150 - 500 - 1000 mg/kg
Group: yes
Method: OECD Test Guideline 408
GLP: yes
Species: Dog, male  
NOAEL: ca. 2,200 mg/kg  
Application Route: Skin contact  
Exposure time: 4 w  
Number of exposures: daily  
Dose: 0,5 - 2 - 8 ml/kg  
Group: yes  
Method: OECD Test Guideline 410  
GLP: yes

Aspiration toxicity

Product:  
no data available

Components:

Ethanediol:  
No aspiration toxicity classification

Further information

Product:  
Remarks: Kidney injury may occur.
Remarks: Poisoning affects the central nervous system
Remarks: The data on toxicology refer to the active ingredient.
Remarks: The classification was made by the conventional (calculation) method of the CLP Regulation (EC) No 1272/2008.

SECTION 12: Ecological information

12.1 Toxicity

Product:  
Toxicity to fish:  
LC0 (Leuciscus idus (Golden orfe)): 1,000 mg/l  
Remarks: By analogy with a product of similar composition

LL50 (Danio rerio (zebra fish)): > 100 mg/l  
Exposure time: 96 h  
Test Type: static test  
Method: OECD Test Guideline 203  
GLP: yes  
Remarks: By analogy with a product of similar composition

Toxicity to daphnia and other aquatic invertebrates:  
Remarks: not tested.

Toxicity to algae:  
Remarks: not tested.
### Components:

**Ethanediol:**

<table>
<thead>
<tr>
<th>Test Type</th>
<th>End Point</th>
<th>Exposure Time</th>
<th>Analytical Monitoring</th>
<th>Method</th>
<th>GLP</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to fish</td>
<td>LC50 (Pimephales promelas (fathead minnow)): 72.860 mg/l</td>
<td>96 h</td>
<td>yes</td>
<td>EPA</td>
<td>no</td>
<td>The details of the toxic effect relate to the nominal concentration.</td>
</tr>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates</td>
<td>EC50 (Daphnia magna (Water flea)): &gt; 100 mg/l</td>
<td>48 h</td>
<td>yes</td>
<td>OECD Test Guideline 202</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>EC50 (Pseudokirchneriella subcapitata (green algae)): 6.500 - 13.000 mg/l</td>
<td>7 d</td>
<td>no data available</td>
<td>EPA</td>
<td>No information available.</td>
<td></td>
</tr>
<tr>
<td>Toxicity to bacteria</td>
<td>EC20 (activated sludge, domestic): &gt; 1.995 mg/l</td>
<td>0.5 h</td>
<td>no</td>
<td>ISO 8192</td>
<td>no</td>
<td>By analogy with a product of similar composition</td>
</tr>
<tr>
<td>Toxicity to fish (Chronic toxicity)</td>
<td>Chronic Toxicity Value: 2.629 mg/l</td>
<td>30 d</td>
<td>Other</td>
<td>Other</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)</td>
<td>NOEC: 8.590 mg/l</td>
<td>7 d</td>
<td>Reproduction rate</td>
<td>Ceriodaphnia spec.</td>
<td>semi-static test</td>
<td></td>
</tr>
</tbody>
</table>

**Toxicity to bacteria:**

Remarks: not tested.
Analytical monitoring: yes
Method: Other
GLP: No information available.
Remarks: The details of the toxic effect relate to the nominal concentration.

Toxicity to soil dwelling organisms:
Remarks: The study is not necessary from a scientific perspective.

Plant toxicity:
Remarks: The study is not necessary from a scientific perspective.

Sediment toxicity:
Remarks: The study is not necessary from a scientific perspective.

Toxicity to terrestrial organisms:
Remarks: The study is not necessary from a scientific perspective.

12.2 Persistence and degradability
Product:
Biodegradability:
Result: Readily biodegradable.
Biodegradation: 90 %
Method: OECD Test Guideline 302B
Remarks: By analogy with a product of similar composition

Components:
Ethanediol:
Biodegradability:
Test Type: aerobic
Inoculum: activated sludge
Concentration: 53 mg/l
Result: Readily biodegradable.
Biodegradation: 90 - 100 %
Related to: DOC decrease
Exposure time: 10 d
Method: OECD Test Guideline 301A
GLP: yes

12.3 Bioaccumulative potential
Product:
Bioaccumulation:
Remarks: not tested.

Components:
Ethanediol:
Bioaccumulation:
Remarks: Due to the low logPow bioaccumulation is not expected
12.4 Mobility in soil

**Product:**
Distribution among environmental compartments: Remarks: not tested.

**Components:**

<table>
<thead>
<tr>
<th>Ethanediol:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution among environmental compartments: Adsorption/Soil Medium: water - soil log Koc: 0 Method: other (calculated)</td>
</tr>
</tbody>
</table>

12.5 Results of PBT and vPvB assessment

**Product:**
Assessment: Remarks: no data available

**Components:**

<table>
<thead>
<tr>
<th>Ethanediol:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment: This substance is not considered to be persistent, bioaccumulating and toxic (PBT).</td>
</tr>
</tbody>
</table>

12.6 Other adverse effects

**Product:**
Additional ecological information: If handled correctly it causes no disturbance in treatment plants.
Determined in the undiluted form
The classification was made by the conventional (calculation) method of the CLP Regulation (EC) No 1272/2008.

**Components:**

<table>
<thead>
<tr>
<th>Ethanediol:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental fate and pathways: not available</td>
</tr>
<tr>
<td>Additional ecological information: Do not allow to enter ground water, waterways or waste water.</td>
</tr>
</tbody>
</table>

SECTION 13: Disposal considerations

13.1 Waste treatment methods

**Product:** Dispose of in accordance with local regulations.
**Contaminated packaging:** Uncontaminated packaging may be reused.
Packaging that cannot be cleaned should be disposed of as product waste

SECTION 14: Transport information

Section 14.1. to 14.5.

ADR: not restricted
ADN: not restricted
RID: not restricted
IATA: not restricted
IMDG: not restricted

14.6. Special precautions for user

See sections 6 to 8 of this Safety Data Sheet.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code (International Bulk Chemicals Code)

No transport as bulk according IBC - Code.

SECTION 15: Regulatory information

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

Other regulations: Apart from the data/regulations specified in this chapter, no further information is available concerning safety, health and environmental protection.

15.2 Chemical safety assessment

Chemical Safety Assessments (CSAs) are available for one or more of the component substances contained in this product.

SECTION 16: Other information

Full text of H-Statements

H302: Harmful if swallowed.
H373: May cause damage to organs through prolonged or repeated exposure if swallowed.

Full text of other abbreviations

Acute Tox.: Acute toxicity
STOT RE: Specific target organ toxicity - repeated exposure

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society
for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; 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; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

**Further information**

**Other information**: Observe national and local legal requirements.

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