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

1.1. Product identifier

Trade name
Antifrogen N

Material number: 107601

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

Relevant identified uses of the substance or mixture
Industry sector: Functional Fluids
Type of use: Brine for refrigeration
Exposure scenarios: see section 15.2.

1.3. Details of the supplier of the safety data sheet

Identification of the company
Clariant Produkte (Deutschland) GmbH
65926 Frankfurt am Main
Telephone no.: +49 69 305 18000

Information about the substance/mixture
Corp Product Stewardship
e-mail: MSDS.CorpPS_BU_ICS@clariant.com

1.4. Emergency telephone number

00800-5121 5121 (24 h)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according CLP regulation (Regulation (EC) No. 1272/2008, as amended)

<table>
<thead>
<tr>
<th>Hazard class</th>
<th>Hazard category</th>
<th>H-phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td>Category 4</td>
<td>Harmful if swallowed.</td>
</tr>
</tbody>
</table>

Classification according EC Directive (67/548/EEC or 1999/45/EC, as amended)

<table>
<thead>
<tr>
<th>Category of danger/Category</th>
<th>Hazard symbol</th>
<th>R - phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Harmful</td>
<td>Harmful if swallowed.</td>
</tr>
</tbody>
</table>

2.2. Label elements

Labelling in accordance with EC-Directives (67/548/EEC or 1999/45/EC, as amended)
hazard warning labelling compulsory, Classification according to the calculation procedure of the Dangerous Preparations Directive (1999/45/EC).
Symbols/Indications of danger

Harmful

R phrases
22 Harmful if swallowed.

S phrases
2 Keep out of the reach of children.
24/25 Avoid contact with skin and eyes.

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

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical characterization
Monoethylene glycol (1,2-ethane diol) with corrosion inhibitors

Hazardous ingredients

Ethanediol
Concentration : >= 90 - <= 95 %
CAS number : 107-21-1
EC number: 203-473-3
Index Number 603-027-00-1

REACH - Registration number according to article 20(3):
01-2119456816-28, 01-2119456816-28-0000, 01-2119456816-28-0003, 01-2119456816-28-XXXX

Classification hazard substance EC
| Xn | Harmful | R 22 |

GHS classification EC

| Specific target organ toxicity - Repeated exposure | Category 2 | H373 |

| Acute toxicity | Category 4 | H302 |

The text of the R-phrases is shown in section 16.
The text of the H-phrases is shown in section 16.
4.1. Description of first aid measures

General information
Remove soiled or soaked clothing immediately

After inhalation
In the event of symptoms seek medical advice.

After contact with skin
In case of contact with skin wash off immediately with plenty of water

After contact with eyes
In case of contact with eyes rinse thoroughly with plenty of water and seek medical advice

After ingestion
Summon a doctor immediately.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms
No symptoms known currently.

Hazards
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
- water spray jet
- alcohol-resistant foam
- carbon dioxide
- dry powder

5.2. Special hazards arising from the substance or mixture
In case of fires, hazardous combustion gases are formed: Carbon monoxide (CO) Nitrous gases (NOx)

5.3. Advice for firefighters

Special protective equipment for firefighting
Use self-contained breathing apparatus

SECTION 6: Accidental release measures

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

6.2. Environmental precautions

Do not allow to enter drains or waterways

6.3. Methods and material for containment and cleaning up

Pick up with absorbent material (eg sand, kieselgur, acid binder, universal binder, sawdust).
Dispose of as prescribed

6.4. Reference to other sections

Additional information
Information regarding Safe handling, see chapter 7.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling
Open and handle container with care.
Provide good ventilation of working area (local exhaust ventilation if necessary).

Hygiene measures
Keep away from foodstuffs and beverages.

Advice on protection against fire and explosion
Observe the general rules of industrial fire protection

7.2. Conditions for safe storage, including any incompatibilities

Advice on storage compatibility
Do not store with alkalies
Do not store with strong oxidizing agents

7.3. Specific end use(s)

No further recommendations.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limit values

<table>
<thead>
<tr>
<th>Substance</th>
<th>EC number</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>203-473-3</td>
<td>107-21-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regulatory basis / Regulatory list</th>
<th>Revision</th>
<th>Type of value</th>
<th>Values</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directive on indicative exposure limits (amended)</td>
<td>08/06/2000</td>
<td>Notations</td>
<td></td>
<td>Skin</td>
</tr>
<tr>
<td>EU OEL - Directive on indicative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
exposure limits

| Directive on indicative exposure limits | 08/06/2000 | Limit values | 52 mg/m³
| (amended) EU OEL - Directive on indicative exposure limits | 08/06/2000 | time-weighted average - 8 hours | 20 ppm

DNEL/DMEL values

<table>
<thead>
<tr>
<th>Chemical</th>
<th>EC number</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanediol</td>
<td>203-473-3</td>
<td>107-21-1</td>
</tr>
</tbody>
</table>

Route of exposure | Personnel | Exposure time/Effect | Value | Remarks |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermal worker</td>
<td>Long term/systemic effects</td>
<td>106 mg/kg bw/day</td>
<td>DNEL</td>
<td></td>
</tr>
<tr>
<td>Inhalation worker</td>
<td>Long term/local effects</td>
<td>35 mg/m³</td>
<td>DNEL</td>
<td></td>
</tr>
<tr>
<td>Dermal general population</td>
<td>Long term/systemic effects</td>
<td>53 mg/kg bw/day</td>
<td>DNEL</td>
<td></td>
</tr>
<tr>
<td>Inhalation general population</td>
<td>Long term/local effects</td>
<td>7 mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PNEC values

<table>
<thead>
<tr>
<th>Chemical</th>
<th>EC number</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanediol</td>
<td>203-473-3</td>
<td>107-21-1</td>
</tr>
</tbody>
</table>

Environmental compartment | Personnel/Exposure time/Effect | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water (fresh water)</td>
<td></td>
<td>10 mg/l</td>
</tr>
<tr>
<td>Water (sea water)</td>
<td></td>
<td>1 mg/l</td>
</tr>
<tr>
<td>Water (intermittent release)</td>
<td></td>
<td>10 mg/l</td>
</tr>
<tr>
<td>Sediment (fresh water)</td>
<td></td>
<td>20.9 mg/kg sediment dw</td>
</tr>
<tr>
<td>Soil</td>
<td></td>
<td>1.53 mg/kg soil dw</td>
</tr>
<tr>
<td>STP</td>
<td></td>
<td>199.5 mg/l</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

General protective measures

Do not inhale vapours
Avoid contact with eyes and skin
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 0.5% by volume. Relevant guidelines to be considered include EN 136/141/143/371/372 as well as other national regulations.

Hand protection: For long-term exposure: Butyl rubber gloves. Minimum breakthrough time / gloves: 480 min. Minimum thickness / gloves 0.7 mm. For short-term exposure (splash protection): Nitrile rubber gloves. Minimum breakthrough time / gloves: 30 min. Minimum thickness / gloves 0.4 mm. 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.

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

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form: Liquid
Particle size: Not applicable
Colour: yellow
Odour: slightly perceptible
Odour threshold: not tested.
\( \text{pH value: } \text{approx. 8 (20 °C, 100 g/l)} \)
Method: DIN 19268
Melting point: \(-32 ^\circ \text{C}\)
Method: DIN 51583
Boiling temperature: approx. 165 °C (1.013 mbar)
Method: ASTM D 1120
Boiling point: 166 °C (1.013 mbar)
Method: ASTM D 1120
Flash point: 119 °C
Method: ASTM D6450 (closed cup)
Evaporation rate: not tested.

Flammability
- Lower explosion limit: 3 % (V)
  Data relate to solvent
- Upper explosive limit: not tested.
- Combustion number: Not applicable
- Minimum ignition energy: not tested.
- Vapour pressure: < 0,01 kPa (20 °C)
  Method: Calculated by Syracuse.
- Vapour density relative to air: not tested.
- Solubility in water: (20 °C)
  miscible in all proportions
- Soluble in ...: fat
  not tested.
- Octanol/water partition coefficient (log Pow): Not applicable
- Ignition temperature: > 400 °C
  Method: DIN 51794
- Self-ignition temperature: not self-igniting
- Thermal decomposition: > 300 °C
  Method: DSC
  Measurement under nitrogen
  No decomposition up to 300 °C.
- Viscosity (dynamic): 20,3 mPa.s (20 °C)
- Viscosity (kinematic): 20,3 mm2/s (20 °C)
  Method: DIN 51562
- Explosive properties: Explosive according to EU supply regulations: no data
- Oxidizing properties: Not applicable

9.2. Other information
- Density: 1,1138 g/cm3 (20 °C)
  Method: DIN 51757
- Bulk density: Not applicable
- Surface tension: 33,8 mN/m

Further information
- The product is hygroscopic.

SECTION 10: Stability and reactivity
10.1. Reactivity
See section 10.3. "Possibility of hazardous reactions"

10.2. Chemical stability
Under normal conditions the product is stable.

10.3. Possibility of hazardous reactions
Reactions with alkalies.
Reactions with oxidising agents.

10.4. Conditions to avoid
None known.

10.5. Incompatible materials
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
Information related to the product itself:

- **Acute oral toxicity**: not tested.
- **Acute dermal toxicity**: LD50 > 3,500 mg/kg (mouse)  
  Data relate to main component.
- **Acute inhalation toxicity**: LC50 > 2,5 mg/l (6 h, rat)  
  Data relate to the main component
- **Irritant effect on skin**: non-irritant (rabbit)  
  Data relate to main component
- **Irritant effect on eyes**: non-irritant (rabbit eye)  
  Data relate to main component
- **Sensitization**: non-sensitizing (Guinea pig)  
  Method: Magnusson/Kligman  
  Data relate to main component
- **Repeated dose toxicity**: Sub-acute oral toxicity  
  Route of application: gavage  
  NOAEL: 200 mg/kg (Rats, male/female)  
  Method: OECD Guide-line 407  
  Repeated Dose Toxicity (subchronic study)  
  Route of application: oral feed  
  NOAEL: 150 mg/kg (Rats, male)  
  Method: OECD Guide-line 408  
  Sub-acute dermal toxicity
Route of application: dermal
NOAEL: 2.22 mg/kg (dog, male)
Method: OECD Guide-line 410
Data relate to the main component

Assessment of mutagenicity:
It is concluded that the product is not mutagenic based on evaluation of several mutagenicity tests.
Data relate to main component

Assessment of carcinogenicity:
No indications of carcinogenic effects are available from long-term trials.
Data relate to main component

Assessment of toxicity to reproduction:
No reproductive toxicity to be expected.
Data relate to main component

Assessment of teratogenicity:
No indications of toxic effects were observed in reproduction studies in animals.
Data relate to main component

Specific target organ toxicity (STOT) - single exposure:
not tested.

Specific target organ toxicity (STOT) - repeated exposure:
not tested.

Information related to the component: Ethanediol
Acute oral toxicity:
LD50 4.700 mg/kg (rat)

Remarks
Vapours and mists cause irritation/burns to eyes and the respiratory tract
There is a possibility of kidney damage
Poisoning affects the central nervous system
The product was classified on the basis of the calculation procedure of the Dangerous Preparations Directive (1999/45/EC).

SECTION 12: Ecological information

12.1. Toxicity

Information related to the product itself:

Fish toxicity:
LC0 1.000 mg/l (golden orfe)
LL50 > 100 mg/l (96 h, Zebra fish (Danio rerio))
Method: OECD 203
By analogy with a similar product.

Daphnia toxicity:
EC50 > 100 mg/l (48 h, Daphnia magna)
Method: OECD 202
Information relates to the main component.

Algae toxicity:
EC50 6.500 - 13.000 mg/l (96 h, Selenastrum capricornutum)
Information relates to the main component.
Bacteria toxicity: EC20 > 1.995 mg/l (30 min, activated sludge)
Method: ISO 8192
Information relates to the main component.

12.2. Persistence and degradability
Information related to the product itself:
Biodegradability: 90 - 100 % (10 d)
Method: OECD 301 A
The product is readily biodegradable according to OECD criteria.
Information relates to the main component.

12.3. Bioaccumulative potential
Information related to the product itself:
Bioaccumulation: not tested.

12.4. Mobility in soil
Information related to the product itself:
Transport and distribution between environmental compartments: not tested.

12.5. Results of PBT and vPvB assessment
Information related to the product itself:
After consideration of all available toxicity and ecotoxicity data it is concluded that the substance does not fulfil the PBT or vPvB criteria.
Data relate to the main component

12.6. Other adverse effects
Information related to the product itself:
Additional ecotoxicological remarks
If handled correctly it causes no disturbance in treatment plants.
The product was classified according to the calculation method of the EU Dangerous Preparations Directive.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Product
In accordance with local authority regulations, take to special waste incineration plant

Uncleaned packaging
Packaging that cannot be cleaned should be disposed of as product waste
SECTION 14: Transport information

Section 14.1. to 14.5.

ADR
ADN
RID
IATA
IMDG
not restricted
not restricted
not restricted
not restricted
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.

Exposure scenarios - links
Please select the specified addresses from the internet in order to see the exposure scenarios.

<table>
<thead>
<tr>
<th>URL</th>
<th>Short title</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="https://reachdialogsystem.clariant.com/ESDocs/EXS000005.pdf">https://reachdialogsystem.clariant.com/ESDocs/EXS000005.pdf</a></td>
<td>Monoethylene glycol - all exposure scenarios</td>
</tr>
</tbody>
</table>
SECTION 16: Other information

Observe national and local legal requirements

Text of the R-phrases assigned to the ingredients/components mentioned in section 3:

22 Harmful if swallowed.

List of the text of the hazard statements mentioned section 3 (H-phrases):

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

Decimal notation: "thousands" places are identified with a dot (for example, "2.000 mg/kg" means "two thousand mg/kg"). Decimal places are identified with a comma (for example, "1,35 g/cm3" means "one point three five g/cm3").

This information corresponds to the present state of our knowledge and is intended as a general description of our products and their possible applications. Clariant makes no warranties, express or implied, as to the information's accuracy, adequacy, sufficiency or freedom from defect and assumes no liability in connection with any use of this information. Any user of this product is responsible for determining the suitability of Clariant's products for its particular application. Nothing included in this information waives any of Clariant's General Terms and Conditions of Sale, which control unless it agrees otherwise in writing. Any existing intellectual/industrial property rights must be observed. Due to possible changes in our products and applicable national and international regulations and laws, the status of our products could change. Material Safety Data Sheets providing safety precautions, that should be observed when handling or storing Clariant products, are available upon request and are provided in compliance with applicable law. You should obtain and review the applicable Material Safety Data Sheet information before handling any of these products. For additional information, please contact Clariant.