

Safety Data Sheet according to Regulation (EC)

No. 1907/2006 (REACH)

Printed 15.11.2019

Revision 15.11.2019 (GB) Version 13.0

Antifrogen® N - water mixture < 25 %

1602-20



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

1.1. Product identifier

Name of product

Antifrogen® N - water mixture < 25 %

Art-Nr(n): 1602-20

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

Identified uses

Product categories [PC]

PC1 - Adhesives, sealants

PC15 - Non-metal-surface treatment products

PC16 - Heat transfer fluids

PC17 - Hydraulic fluids

PC18 - Ink and toners

PC24 - Lubricants, greases, release products

PC31 - Polishes and wax blends

PC32 - Polymer preparations and compounds

PC34 - Textile dyes, finishing and impregnating products; including bleaches and other processing aids

PC35 - Washing and cleaning products (including solvent based products)

PC4 - Anti-freeze and de-icing products

PC9a - Coatings and paints, thinners, paint removers.

! Process categories [PROC]

PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

PROC6 - Calendering operations

PROC7 - Industrial spraying

PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC10 - Roller application or brushing

PROC13 - Treatment of articles by dipping and pouring

PROC14 - production of preparations or articles by tableting, compression, extrusion, pelettisation

PROC17 - Lubrication at high energy conditions and in partly open process

PROC18 - Greasing at high energy conditions

PROC11 - Non industrial spraying

PROC15 - Use as laboratory reagent

PROC19 - Hand-mixing with intimate contact and only PPE available

PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems

! Environmental release categories [ERC]

ERC1 - Manufacture of substances

ERC7 - Industrial use of substances in closed systems

ERC8a - Wide dispersive indoor use of processing aids in open systems

ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix

ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix

ERC9a - Wide dispersive indoor use of substances in closed systems

ERC9b - Wide dispersive outdoor use of substances in closed systems

ERC6c - Industrial use of monomers for manufacture of thermoplastics.

ERC6d - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers.

Recommended intended purpose(s)

Cooling liquid brine.

Convactor fluid.

Functional fluid.

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1.3. Details of the supplier of the safety data sheet

Manufacturer/distributor

GHC Gerling, Holz & Co. Handels GmbH
Ruhrstraße 113, D-22761 Hamburg
Phone +49 40 853 123-0, Fax +49 40 853 123-66
E-Mail hamburg@ghc.de
Internet www.ghc.com

Advice

GHC Gerling, Holz & Co. Handels GmbH
Phone +49 40 853 123-0
Fax +49 40 853 123-66
E-mail (competent person):
msds@ghc.de

1.4. Emergency telephone number

Emergency advice

Medizinische Notfallouskunft bei Vergiftungen:
Giftinformationszentrum Mainz - 24 h
Phone +49 6131 19240

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard classes and Hazard categories	Hazard Statements	Classification procedure
--------------------------------------	-------------------	--------------------------

STOT RE 2

H373

! Hazard statements for health hazards

H373 May cause damage to organs through prolonged or repeated exposure.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]



GHS08

Signal word

Warning

! Hazard statements for health hazards

H373 May cause damage to organs through prolonged or repeated exposure.

Precautionary Statements

! Prevention

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

Response

P314 Get medical advice/attention if you feel unwell.

Hazardous ingredients for labeling

ethanediol

2.3. Other hazards

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Information pertaining to special dangers for human and environment

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

Results of PBT and vPvB assessment

The substances in this mixture do not meet the PBT/vPvB criteria of REACH, annex XIII.

SECTION 3: Composition/ information on ingredients

3.1. Substances

not applicable

3.2. Mixtures

Hazardous ingredients

CAS No	EC No	Name	[% weight]	Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]
107-21-1	203-473-3	ethanediol	< 25	Acute Tox. 4, H302 / STOT RE 2, H373

REACH

CAS No	Name	REACH registration number
107-21-1	ethanediol	01-2119456816-28

Additional advice

The text of the H-and EUH-phrases is shown in section 16.

Aqueous solution of ethylene glycol (Ethanediol) with corrosion inhibitors.

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

Remove contaminated soaked clothing immediately.

Adhere to personal protective measures when giving first aid.

In case of inhalation

Remove the casualty into fresh air and keep him immobile.

In the event of symptoms refer for medical treatment.

In case of skin contact

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

Consult a doctor if skin irritation persists.

In case of eye contact

Eye rinsing with water carefully while protecting unhurt eye.

Call for a doctor immediately.

Remove contact lenses, if present and easy to do. Continue rinsing.

In case of ingestion

Call for a doctor immediately.

Rinse out mouth thoroughly with water.

Induce vomiting.

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

Physician's information / possible symptoms

Symptoms: The most well-known symptoms and effects are described in the labeling of the product (see Section 2) and / or in the toxicological data (see section 11).

Physician's information / possible dangers

Not known.

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4.3. Indication of any immediate medical attention and special treatment needed

Treatment (Advice to doctor)

Treat symptoms.

! SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Product does not burn, fire-extinguishing activities according to surrounding.

Alcohol-resistant foam

Dry powder

Carbon dioxide

Water spray jet

Unsuitable extinguishing media

Full water jet

5.2. Special hazards arising from the substance or mixture

In case of fire formation of dangerous gases possible.

Nitrogen oxides (NO_x)

Carbon monoxide (CO)

Carbon dioxide (CO₂)

5.3. Advice for firefighters

Special protective equipment for fire-fighters

Use breathing apparatus with independent air supply (isolated).

Wear full protective clothing.

Additional information

Cool endangered containers with water spray jet.

Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Evacuate area.

Keep people away and stay on the upwind side.

For emergency responders

Ensure adequate ventilation.

Remove persons to safety.

Personal protection by wearing close-fitting protective clothing and breathing apparatus.

6.2. Environmental precautions

Do not discharge into the drains/surface waters/groundwater.

Prevent spread over a wide area (e.g. by containment or oil barriers).

Do not discharge into the subsoil/soil.

6.3. Methods and material for containment and cleaning up

Take up with absorbent material (e.g. sand, kieselguhr, acid binder, general-purpose binder, sawdust).

Clean contaminated objects and floor thoroughly under consideration of environment regulations.

Flush away residues with water.

Dispose of contaminated material in accordance with regulations.

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6.4. Reference to other sections

Safe handling: see section 7

Disposal: see section 13

Personal protection equipment: see section 8

! SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

In case of free handling thoroughly sucking off vapours is necessary.

Avoid formation of aerosols.

Care for thoroughly room ventilation, if necessary use in well ventilated area with local exhaust ventilation at workplace.

Open and handle container with care!

Avoid release to the environment.

! General protective measures

Avoid contact with eyes and skin

Do not inhale gases/vapours/aerosols.

Hygiene measures

At work do not eat, drink and smoke.

Wash hands before breaks and after work.

Advice on protection against fire and explosion

The product is not combustible.

Pay attention to general rules of internal fire prevention.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep in closed original container.

Ventilate store-rooms thoroughly.

All regulations and local requirements for the storage of containers have to be respected.

Advice on storage compatibility

Do not store together with animal feedstuffs.

Do not store together with explosives.

Do not store together with infectious substances.

Do not store together with radioactive material.

Do not store together with food.

Further information on storage conditions

Store only in closed original container at cool and aired place.

7.3. Specific end use(s)

! Recommendation(s) for intended use

See section 1.2

Exposure scenarios (ES) see annex to this safety data sheet.

! SECTION 8: Exposure controls/personal protection

8.1. Control parameters

! Ingredients with occupational exposure limits to be monitored

CAS No	Name	Code	[mg/m3]	[ppm]	Remark
107-21-1	Ethanediol; Ethylene glycol (vapour)	WEL, 8 hours	52	20	EH40, UK
		Short-term	104	40	

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Ingredients with occupational exposure limits to be monitored (continued)

CAS No	Name	Code	[mg/m3]	[ppm]	Remark
107-21-1	Ethanediol; Ethylene glycol	TLV, 8 hours	100		Aerosol, ceiling limit, ACGIH, USA

Indicative occupational exposure limit values (91/322/EEC, 2000/39/EC, 2004/37/EC, 2006/15/EC or 2009/161/EU)

CAS No	Name	Code	[mg/m3]	[ppm]	Remark
107-21-1	ethanediol	8 hours	52	20	skin
		Short-term	104	40	

DNEL-/PNEC-values**DNEL worker**

CAS No	Substance name	Value	Code	Remark
107-21-1	ethanediol	106 mg/ kg bw/day	DNEL long-term dermal (systemic)	
		35 mg/m3	DNEL long-term inhalative (local)	

DNEL Consumer

CAS No	Substance name	Value	Code	Remark
107-21-1	ethanediol	53 mg/kg bw/day	DNEL long-term dermal (systemic)	
		7 mg/m3	DNEL long-term inhalative (local)	

PNEC

CAS No	Substance name	Value	Code	Remark
107-21-1	ethanediol	37 mg/kg dw	PNEC sediment, freshwater	Extrapolation
		1,53 mg/ kg dw	PNEC soil	Extrapolation
		10 mg/l	PNEC aquatic, freshwater	Assessment factor 10, Extrapolation
		199,5 mg/l	PNEC sewage treatment plant (STP)	Assessment factor 10, Extrapolation
		10 mg/l	PNEC aquatic, intermittent release	Assessment factor 10, Extrapolation
		1 mg/l	PNEC aquatic, marine water	Assessment factor 100, Extrapolation
		3,7 mg/kg dw	PNEC sediment, marine water	Extrapolation

8.2. Exposure controls**Respiratory protection**

In case of insufficient ventilation or long-term effect use breathing apparatus.

Full mask complying with EN 136.

Breathing apparatus in the event of aerosol or mist formation.

Keep self contained breathing apparatus readily available for emergency use.

Full mask, filter A

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! Hand protection

Glove material specification [make/type, thickness, permeation time/life]: NBR; 0,4 mm; >= 30 min

Glove material specification [make/type, thickness, permeation time/life]: IIR, >= 0,7 mm, > 480 min

Eye protection

Protective goggles according to EN 166, in case of increased risk add protective face shield.

Other protection measures

Safety shoes with steel toe.

Body covering work clothing, or chemical resistant suit at increased risk.

Appropriate engineering controls

Transfer and handle only in enclosed systems.

Industrial ventilation (local ventilation).

! SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties****Appearance**

liquid

Colour

light yellow

Odour

hardly noticeable

Odour threshold

not determined

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value	ca. 8	20 °C	100 g/l	DIN 19268	
boiling point	103 °C		1013 hPa	ASTM D 1120	
melting point	-11 °C			DIN 51583	
Flash point	no			ASTM D6450 (closed cup)	
Vapourisation rate	not determined				
Flammable (solid)	not applicable				
Flammability (gas)	not applicable				
Ignition temperature	not applicable				
Self ignition temperature	no				
Lower explosion limit	not determined				
Upper explosion limit	not determined				
Vapour pressure	< 0,1 hPa	20 °C		calculated	

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	Value	Temperature	at	Method	Remark
Relative density	1,0259 g/cm ³	20 °C		DIN 51757	
Bulk density	not applicable				
Vapour density	not determined				
Solubility in water		20 °C			multimiscible
Solubility/other	not determined				
Partition coefficient n-octanol/water (log P O/W)	-1,36				Information concerns to Ethanediol.
Decomposition temperature	> 250 °C			DSC	Determination in a nitrogen atmosphere
Viscosity dynamic	1,72 mPa*s	20 °C			
Viscosity kinematic	1,68 mm ² /s	20 °C		DIN 51562	
Oxidising properties	no				
Explosive properties	no				
9.2. Other information	Product effects hygroscopic.				

! SECTION 10: Stability and reactivity**10.1. Reactivity**

See section "Possibility of hazardous reactions".

10.2. Chemical stability

Stable under recommended conditions of use and storage (see section 7).

10.3. Possibility of hazardous reactions

Reactions with sulphuric acid

Reactions with alkalies.

10.4. Conditions to avoid

Avoid contact with open flames, glowing metal surfaces, etc..

10.5. Incompatible materials**Substances to avoid**

Alkali (lye)

Sulphuric acid, concentrated

Oxidants.

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10.6. Hazardous decomposition products

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

Thermal decomposition

Method DSC

Remark No decomposition below 250°C.

! SECTION 11: Toxicological information**11.1. Information on toxicological effects****Acute toxicity/Irritation/Sensitization**

	Value/Validation	Species	Method	Remark
LD50 acute oral	> 2000 mg/kg		Calculated	
LD50 acute dermal	> 3500 mg/kg	mouse		Information concerns to Ethanediol.
LC50 acute inhalation	> 2,5 mg/l (6 h)	rat (male / female)		Information concerns to Ethanediol.
Skin irritation	non-irritant	rabbit		Information concerns to Ethanediol.
Eye irritation	non-irritant	rabbit eye		Information concerns to Ethanediol.
Skin sensitization	non-sensitizing	guinea pig	OECD 406	Information concerns to Ethanediol.
Sensitization respiratory system	not determined			

Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
Subacute Toxicity	NOAEL 2200 - 4400 mg/kg (28 d) Sub-acute dermal toxicity Information concerns to Ethanediol.	Dog	OECD 410	No effects of toxicological significance.
Subchronic Toxicity	NOAEL 150 mg/kg (111 - 203 d) Subchronic oral toxicity (feed) Information concerns to Ethanediol.	Rat	OECD 408	No effects of toxicological significance.
Chronic Toxicity	NOAEL 150 mg/kg (1 a) Chronic oral toxicity (feed) Information concerns to Ethanediol.	Rat	OECD 452	No effects of toxicological significance.

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	Value	Species	Method	Validation
Mutagenicity	Information concerns to Ethanediol.			No experimental information on genotoxicity in vitro and in vivo available.
Reproduction-Toxicity	NOAEL > 1000 mg/kg	Rat (male / female)		No indications of toxic effects were observed in reproduction studies in animals.
	Oral Information concerns to Ethanediol.			
Carcinogenicity	NOAEL 1500 mg/kg (2 a)	Mouse		No indications of carcinogenic effects are available from long-term trials.
	Oral. Information concerns to Ethanediol.			

Specific target organ toxicity (single exposure)

Substance or mixture is not classified in GHS-criteria as specific target organ toxic with single exposure.

! Specific target organ toxicity (repeated exposure)

May cause damage to organs through prolonged or repeated exposure.

! Aspiration hazard

No data available

Experiences made from practice

Symptoms of poisoning: effects on central nervous system (CNS) and gastrointestinal tract (nausea, vomiting, dizziness, reflex inhibition, epileptiform seizures, convulsions, coma, respiratory arrest, circulatory collapse) within 30 min to 12 h.

Symptoms of poisoning: effects on cardiac and pulmonary function (acceleration of pulse and breathing, increased blood pressure, possibly inflammatory mucosal changes, pulmonary edema, congestive heart failure) within 12-24 h.

Symptoms of poisoning: renal impairment (oliguria to anuria, degeneration of the kidney tissue with oxalate crystal deposits) within 24-72 h.

Symptoms of poisoning: degeneration of the central nervous system (double-sided facial paralysis, pupillary inequality, blurred vision, dysphagia, hyperreflexia, incoordination, cerebral oedema, deposit of calcium oxalate in the brain) within 6-14 days.

! Additional information

The product has not been tested. The information is derived from the properties of the individual components.

! SECTION 12: Ecological information**12.1. Toxicity****Ecotoxicological effects**

	Value	Species	Method	Validation
Fish	LL50 > 100 mg/l (96 h)	Danio rerio	OECD 203	Analogous to a similar product.
Daphnia	EC50 > 100 mg/l (48 h)	Daphnia magna	OECD 202	Information concerns to Ethanediol.
Algae	EC50 6500 - 13000 mg/l (96 h)	Selenastrum capricornutum		Information concerns to Ethanediol.

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	Value	Species	Method	Validation
Bacteria	EC20 > 1995 mg/l (30 min)	activated sludge (kom.)	ISO 8192	Information concerns to Ethanediol.

12.2. Persistence and degradability

	Elimination rate	Method of analysis	Method	Validation
Biological degradability	90 - 100 %		OECD 301 A	The product is readily biodegradable to OECD criteria.
Information concerns to Ethanediol.				

12.3. Bioaccumulative potential

Bioaccumulation improbable.

Because of the n-octanol/water distribution coefficient (log K o/w) accumulation in organisms is not expected.

12.4. Mobility in soil

High mobility

12.5. Results of PBT and vPvB assessment

The substances in this mixture do not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6. Other adverse effects

Not known.

General regulation

Avoid release to the environment.

! SECTION 13: Disposal considerations**13.1. Waste treatment methods****Waste code No.**

16 01 14*

Name of waste

antifreeze fluids containing hazardous substances

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 2008/98/EC on hazardous waste.

Recommendations for the product

Dispose of in accordance with the local official regulations.

Return to manufacturer.

! Recommendations for packaging

Dispose of in accordance with the local official regulations.

Totally emptied packaging: Return to supplier / manufacturer.

! General information

Operators of stationary equipment shall be responsible for putting in place arrangements for the proper recovery.

! SECTION 14: Transport information

	ADR/RID	IMDG	IATA-DGR
14.1. UN number	-	-	-
14.2. UN proper shipping name	-	-	-

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	ADR/RID	IMDG	IATA-DGR
14.3. Transport hazard class(es)	-	-	-
14.4. Packing group	-	-	-
14.5. Environmental hazards	-	-	-

14.6. Special precautions for user

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

not applicable

No transport as bulk according IBC - Code.

Land and inland navigation transport ADR/RID

No dangerous goods as defined by these transport regulations.

Marine transport IMDG

No hazardous material as defined by the prescriptions.

Air transport ICAO/IATA-DGR

No hazardous material as defined by the prescriptions.

! SECTION 15: Regulatory information

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

No information available.

15.2. Chemical Safety Assessment

Exposure scenarios (ES) see annex to this safety data sheet.

Chemical safety assessments for substances in this mixture were carried out.

! SECTION 16: Other information

Recommended uses and restrictions

National and local regulations concerning chemicals shall be observed.

® Clariant International Ltd.'s registered trademark.

Further information

The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Indication of changes: "!" = Data changed compared with the previous version. Previous version: 12.0

! Sources of key data used

For the preparation of this safety data sheet, information from our suppliers as well as data from the "database of registered substances" of the European Chemicals Agency (ECHA) were used.

H302 Harmful if swallowed.

H373 May cause damage to organs (or state all organs affected, if known) through prolonged or repeated exposure (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard).

Annex: Exposure scenarios

Exposure Scenario(s)

Number	Title
ES 1	Industrial use; Use as an intermediate PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15 - ERC6a Ethane-1,2-diol
ES 2	Industrial use; Industrial use of processing aids in processes and products, not becoming part of articles PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15 - ERC4 Ethane-1,2-diol
ES 3	Industrial use; Distribution of substance PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15 - ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7 Ethane-1,2-diol
ES 4	Industrial use; Formulation [mixing] of preparations and/or re-packaging PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15 - ERC2 Ethane-1,2-diol
ES 5	Industrial use; Polymer production PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC15 - ERC6c Ethane-1,2-diol
ES 6	Industrial use; Paint, Coatings PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC15 - ERC4 Ethane-1,2-diol
ES 7	Professional use; Paint, Coatings, Adhesives, sealants, Foaming, Polymer processing PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC19 - ERC8a, ERC8c, ERC8d, ERC8f Ethane-1,2-diol
ES 8	Consumer use; Coatings and paints, thinners, paint removers, Surface treatment PC9a, PC15, PC18, PC31, PC24, PC34 - ERC8a, ERC8c, ERC8d, ERC8f Ethane-1,2-diol
ES 9	Industrial use; Use in cleaning agents PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13 - ERC4

Annex: Exposure scenarios

	Ethane-1,2-diol
ES 10	Professional use; Use in cleaning agents PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13 - ERC8a, ERC8d Ethane-1,2-diol
ES 11	Consumer use; Use in cleaning agents PC35 - ERC8a, ERC8d Ethane-1,2-diol
ES 12	Industrial use; Lubricants PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18 - ERC4, ERC7 Ethane-1,2-diol
ES 13	Industrial use; Metal working fluids PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17 - ERC4 Ethane-1,2-diol
ES 14	Professional use; Metal working fluids PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17 - ERC8a, ERC8d Ethane-1,2-diol
ES 15	Professional use; Use in agrochemicals PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC9, PROC11, PROC13 - ERC8a, ERC8d Ethane-1,2-diol
ES 16	Industrial use; Functional Fluids PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9 - ERC7 Ethane-1,2-diol
ES 17	Professional use; Functional Fluids PROC1, PROC2, PROC3, PROC4, PROC8a, PROC9, PROC20 - ERC9a, ERC9b Ethane-1,2-diol
ES 18	Consumer use; Heat transfer fluids, Hydraulic fluids PC16, PC17 - ERC9a, ERC9b Ethane-1,2-diol
ES 19	Professional use; Anti-freeze and de-icing products PROC1, PROC2, PROC8a, PROC8b, PROC11 - ERC8d Ethane-1,2-diol
ES 20	Consumer use; Anti-freeze and de-icing products PC4 - ERC8d Ethane-1,2-diol

Annex: Exposure scenarios

ES 21	Industrial use, Professional use; Laboratory use PROC15 - ERC8a Ethane-1,2-diol
ES 22	Industrial use; Water treatment chemicals PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC13 - ERC3, ERC4 Ethane-1,2-diol
ES 23	Consumer use; Adhesives, sealants PC1 - ERC8c, ERC8f Ethane-1,2-diol
ES 24	Industrial use; Manufacture of substance, Adhesives, sealants, Foaming, Coatings, Polymer production PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15 - ERC2, ERC3, ERC5, ERC6c Ethane-1,2-diol
ES 25	Consumer use; Insulation foams PC32 - ERC8c, ERC8f Ethane-1,2-diol

Due to the extent of the Annex: Exposure Scenarios, our automated shipping will send you a shortened version of the safety data sheet containing only an overview of each exposure scenario.

The current version of the safety data sheet with complete appendix: Exposure Scenarios is at any time available for download on our homepage:
<https://www.ghc.de/pages/en/services.php>