! 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).: 1602-27 - 1602-52

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 tabletting, 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.
Convector fluid.
Functional fluid.

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 Notfallauskunft 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
Acute Tox. 4	**H302**	
STOT RE 2	**H373**	

! **Hazard statements for health hazards**

H302 **Harmful if swallowed.**
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]

GHS07 **GHS08**

Signal word
Warning

! **Hazard statements for health hazards**

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 hands 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.

Hazardous ingredients for labeling
ethanediol

2.3. Other hazards
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**	**>= 22,5 - 60**	**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.

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 (NOx)
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.

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	
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

! **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	Colour	Odour
liquid	light yellow	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	104 - 110 °C		1013 hPa	ASTM D 1120	
melting point	-61 - -15 °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			DIN 51794	
Self ignition temperature	no				

	Value	Temperature	at	Method	Remark
Lower explosion limit	not determined				
Upper explosion limit	not determined				
Vapour pressure	< 0,1 hPa	20 °C		calculated	
Relative density	1,0371 - 1,072 g/cm3	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	2,05 - 4,57 mPa*s	20 °C			
Viscosity kinematic	1,98 - 4,26 mm2/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.

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	985,1 - 1835 mg/kg		Calculated	
LD50 acute dermal	> 3500 mg/kg	mouse		Information concerns to Ethanediol.
LC50 acute inhalation	> 2,5 mg/l (6 h)	rat		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

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

! **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 declarations of toxicology refer to Ethanediol.
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.
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 % (10 d)		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.	**Name of waste**
16 01 14*	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	-	-	-
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