



SAFETY DATA SHEET

Prefere 4535

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

1.1 Product identifier

Product name : Prefere 4535

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

Use of the substance/
mixture : Industrial/Professional Use: Adhesive. Woodworking industry.

1.3 Details of the supplier of the safety data sheet

Supplier : Dynea AS
P.O.Box 160, N-2001 Lillestrøm
Norway
Tel. +47 63897100
Fax. +47 63897610

e-mail address of person
responsible for this SDS : sds@dynea.com

1.4 Emergency telephone number

National advisory body/Poison Centre

Telephone number : Not available.

Supplier

Telephone number : +47 63897100

Hours of operation : 24 hours

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

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

The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

Skin Sens. 1, H317

Carc. 1B, H350

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms :



SECTION 2: Hazards identification

Signal word	: Danger
Hazard statements	: H317 - May cause an allergic skin reaction. H350 - May cause cancer.
Precautionary statements	: P201 - Obtain special instructions before use. P280 - Wear protective gloves. Wear protective clothing. Wear eye or face protection. P308 + P313 - IF exposed or concerned: Get medical attention. P302 + P352 - IF ON SKIN: Wash with plenty of soap and water. P405 - Store locked up. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazardous ingredients	: Formaldehyde
Supplemental label elements	: Not applicable.
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	: Restricted to professional users.

Special packaging requirements

Not applicable.

2.3 Other hazards

Other hazards which do not result in classification : None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	%	Classification	Type
butane-1,4-diol	REACH #: 01-2119471849-20 EC: 203-786-5 CAS: 110-63-4	≤3	Acute Tox. 4, H302 STOT SE 3, H336	[1]
methanol	REACH #: 01-2119433307-44 EC: 200-659-6 CAS: 67-56-1 Index: 603-001-00-X	<3	Flam. Liq. 2, H225 Acute Tox. 3, H301 Acute Tox. 3, H311 Acute Tox. 3, H331 STOT SE 1, H370 (central nervous system (CNS), optic nerve)	[1] [2]
ε-caprolactam	REACH #: 01-2119457029-36 EC: 203-313-2 CAS: 105-60-2 Index: 613-069-00-2	≤2,5	Acute Tox. 4, H302 Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335	[1] [2]
formaldehyde	REACH #: 01-2119488953-20 EC: 200-001-8 CAS: 50-00-0 Index: 605-001-00-5	≤0,53	Acute Tox. 3, H301 Acute Tox. 3, H311 Acute Tox. 2, H330 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Muta. 2, H341 Carc. 1B, H350 STOT SE 3, H335	[1] [2]

SECTION 3: Composition/information on ingredients

			See Section 16 for the full text of the H statements declared above.
--	--	--	--

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs or vPvBs or have been assigned a workplace exposure limit and hence require reporting in this section.

Type

- Substance classified with a health or environmental hazard
- Substance with a workplace exposure limit
- Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- Substance of equivalent concern
- Additional disclosure due to company policy

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Get medical attention.
- Inhalation** : Move exposed person to fresh air. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Skin contact** : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if irritation occurs.
- Ingestion** : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe.
- General** : Move the victim to a safe area as soon as possible. If unconscious, place in recovery position and seek medical advice. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Allow the victim to rest in a well-ventilated area.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

- Inhalation** : Vapour may be irritating to eyes and respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- Skin contact** : May cause an allergic skin reaction.

Over-exposure signs/symptoms

- Skin contact** : Adverse symptoms may include the following:
irritation
redness

4.3 Indication of any immediate medical attention and special treatment needed

- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Specific treatments** : No specific treatment.

SECTION 4: First aid measures

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use dry chemical, CO₂, water spray (fog) or foam.

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

5.3 Advice for firefighters

Special precautions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and material for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Absorb with liquid-binding material (sand, diatomite, universal binders etc.) or use a spill kit.

Large spill : Approach the release from upwind. Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Contaminated absorbent material may pose the same hazard as the spilt product.

SECTION 6: Accidental release measures

6.4 Reference to other sections : See Section 1 for emergency contact information.
 See Section 8 for information on appropriate personal protective equipment.
 See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapour or mist.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store away from incompatible materials (see Section 10). Store locked up. Keep away from food, drink and animal feeding stuffs. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

7.3 Specific end use(s)

Recommendations : Not available.

Industrial sector specific solutions : Not available.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
methanol	EH40/2005 WELs (United Kingdom (UK), 12/2011). Absorbed through skin. STEL: 333 mg/m ³ 15 minutes. STEL: 250 ppm 15 minutes. TWA: 266 mg/m ³ 8 hours. TWA: 200 ppm 8 hours.
ε-caprolactam	EH40/2005 WELs (United Kingdom (UK), 12/2011). STEL: 20 mg/m ³ 15 minutes. Form: Dust and vapour TWA: 10 mg/m ³ 8 hours. Form: Dust and vapour STEL: 3 mg/m ³ 15 minutes. Form: inhalable dust TWA: 1 mg/m ³ 8 hours. Form: inhalable dust
formaldehyde	EH40/2005 WELs (United Kingdom (UK), 12/2011). STEL: 2,5 mg/m ³ 15 minutes. STEL: 2 ppm 15 minutes. TWA: 2 ppm 8 hours.

SECTION 8: Exposure controls/personal protection

TWA: 2,5 mg/m³ 8 hours.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
butane-1,4-diol	DNEL	Long term Inhalation	136 mg/m ³	Workers	Systemic
	DNEL	Long term Inhalation	658 mg/m ³	Workers	Local
	DNEL	Long term Dermal	19 mg/kg	Workers	Systemic
	DNEL	Long term Inhalation	29 mg/m ³	Consumers	Systemic
	DNEL	Short term Inhalation	340 mg/m ³	Consumers	Local
	DNEL	Long term Dermal	8 mg/kg	Consumers	Systemic
	DNEL	Long term Oral	8 mg/kg	Consumers	Systemic
	DNEL	Short term Dermal	40 mg/kg	Workers	Systemic
	DNEL	Short term Inhalation	260 mg/m ³	Workers	Systemic
	DNEL	Short term Inhalation	260 mg/m ³	Workers	Local
	DNEL	Long term Dermal	40 mg/kg	Workers	Systemic
	DNEL	Long term Inhalation	260 mg/m ³	Workers	Systemic
	DNEL	Long term Inhalation	260 mg/m ³	Workers	Local
	DNEL	Short term Dermal	8 mg/kg	Consumers	Systemic
	DNEL	Short term Inhalation	50 mg/m ³	Consumers	Systemic
	DNEL	Short term Oral	8 mg/kg	Consumers	Systemic
	DNEL	Short term Inhalation	50 mg/m ³	Consumers	Local
	methanol	DNEL	Long term Dermal	8 mg/kg	Consumers
DNEL		Long term Inhalation	50 mg/m ³	Consumers	Systemic
DNEL		Long term Oral	8 mg/kg	Consumers	Systemic
DNEL		Long term Inhalation	50 mg/m ³	Consumers	Local
DNEL		Long term Oral	8 mg/kg	Consumers	Systemic
DNEL		Long term Inhalation	50 mg/m ³	Consumers	Local
ε-caprolactam	DNEL	Short term Inhalation	10 mg/m ³	Workers	Local
	DNEL	Long term Inhalation	5 mg/m ³	Workers	Local
	DNEL	Short term Inhalation	5 mg/m ³	Consumers	Local

SECTION 8: Exposure controls/personal protection

formaldehyde	DNEL	Long term Inhalation	2,5 mg/m ³	Consumers	Local
	DNEL	Long term Oral	8,55 mg/kg bw/day	Consumers	Systemic
	DNEL	Short term Inhalation	0,6 ppm	Workers	Local
	DNEL	Long term Dermal	240 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	9 mg/m ³	Workers	Systemic
	DNEL	Long term Dermal	37 µg/cm ²	Workers	Local
	DNEL	Long term Inhalation	0,3 ppm	Workers	Local
	DNEL	Long term Dermal	102 mg/kg bw/day	Consumers	Systemic
	DNEL	Long term Inhalation	2,6 ppm	Consumers	Systemic
	DNEL	Long term Oral	4,1 mg/kg bw/day	Consumers	Systemic
	DNEL	Long term Dermal	12 µg/cm ²	Consumers	Local
	DNEL	Long term Inhalation	0,1 ppm	Consumers	Local

PNECs

Product/ingredient name	Type	Compartment Detail	Value	Method Detail
butane-1,4-diol	-	Fresh water	0,813 mg/l	-
	-	Marine water	0,0813 mg/l	-
	-	Fresh water sediment	3,61 mg/kg	-
	-	Marine water sediment	0,361 mg/kg	-
	-	Sewage Treatment Plant	1554 mg/l	-
	-	Soil	0,244 mg/kg	-
	methanol	PNEC	Fresh water	20,8 mg/l
PNEC		Marine	2,08 mg/l	Assessment Factors
PNEC		Intermittent release	1540 mg/l	Assessment Factors
PNEC		Fresh water sediment	77 mg/kg dwt	Equilibrium Partitioning
PNEC		Soil	100 mg/kg wwt	Equilibrium Partitioning
PNEC		Marine water sediment	7,7 mg/kg dwt	Equilibrium Partitioning
PNEC		Sewage Treatment Plant	100 mg/l	Assessment Factors
ε-caprolactam	PNEC	Fresh water	2 mg/l	-
	PNEC	Marine	0,2 mg/l	-
	PNEC	Sewage Treatment Plant	1737 mg/l	-
formaldehyde	PNEC	Fresh water sediment	18,7 mg/kg dwt	-
	PNEC	Soil	2,55 mg/kg dwt	-
	PNEC	Fresh water	0,44 mg/l	Assessment Factors
	PNEC	Marine	0,44 mg/l	Assessment Factors
	PNEC	Intermittent release	4,44 mg/l	Assessment Factors
	PNEC	Fresh water sediment	2,3 mg/kg dwt	Equilibrium Partitioning
	PNEC	Marine water sediment	2,3 mg/kg dwt	Equilibrium Partitioning
	PNEC	Soil	0,2 mg/kg dwt	Equilibrium Partitioning
PNEC	Sewage Treatment Plant	0,19 mg/l	Assessment Factors	

8.2 Exposure controls

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

SECTION 8: Exposure controls/personal protection

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Immediately remove any contaminated clothing, shoes or socks. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Use eye protection according to EN 166, designed to protect against liquid splashes. Recommended: Safety glasses with side shields.
- Hand protection** : Wear suitable gloves tested to EN374. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers.
Recommended : Protective Index 6 / Breakthrough time >480 minutes: neoprene rubber 0.7 mm thickness or nitrile rubber 0.4 mm thickness
- Other skin protection** : Wear work clothing with long sleeves. Cotton or cotton/synthetic overalls or coveralls are normally suitable.
Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. No personal respiratory protective equipment normally required.
Long Term Exposure / high concentrations : Self-contained respirator (DIN EN 133) or full face mask (DIN EN 136)
Short term exposure / Low exposure : Half-face mask (DIN EN 140)
Recommended: Type AX (Brown): Low boiling organic compounds.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

- Physical state** : Liquid.
- Colour** : Greyish-white.
- Odour** : Formaldehyde. [Slight]
- Odour threshold** : Not available.
- pH** : 8,5 to 10
- Melting point/freezing point** : Not available.
- Initial boiling point and boiling range** : Not available.
- Flash point** : Closed cup: >100°C
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Not available.
- Upper/lower flammability or explosive limits** : Not available.
- Vapour pressure** : Not available.
- Vapour density** : Not available.
- Relative density** : Not available.
- Density (liquid)** : 1,26 g/cm³ [25°C]
- Solubility** : Partly dispersible in water
- Partition coefficient: n-octanol/water** : <0
- Auto-ignition temperature** : Not available.

SECTION 9: Physical and chemical properties

Decomposition temperature : Not available.
 Viscosity : Dynamic: 3000 to 6000 mPa·s [25 °C]
 Explosive properties : Not available.
 Oxidising properties : Not available.

9.2 Other information

VOC content (Without volume exclusion) : 5,5 % (w/w)
 88,8 g/l

SECTION 10: Stability and reactivity

10.1 Reactivity : No specific test data related to reactivity available for this product or its ingredients.
 10.2 Chemical stability : The product is stable.
 10.3 Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.
 10.4 Conditions to avoid : No specific data.
 10.5 Incompatible materials : No specific data.
 10.6 Hazardous decomposition products : Formaldehyde may be released during processing.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Potential Adverse effects

Inhalation : Vapour may be irritating to eyes and respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact : May cause an allergic skin reaction.
 Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
 Adverse symptoms may include the following:
 irritation
 redness

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
butane-1,4-diol methanol	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	1500 mg/kg	-
	LC50 Inhalation Vapour	Rat - Male, Female	128,2 mg/l	4 hours
ε-caprolactam	LD50 Dermal	Rabbit	17100 mg/kg	-
	LC50 Inhalation Vapour	Rat	8,16 mg/l	4 hours
	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
formaldehyde	LD50 Oral	Rat - Female	1475 mg/kg	-
	LC50 Inhalation Gas.	Rat	<463 mg/l	4 hours
	LD50 Oral	Rat - Male	460 mg/kg	-

SECTION 11: Toxicological information

butane-1,4-diol: Harmful if swallowed.
methanol: Toxic by inhalation, in contact with skin and if swallowed.
ε-caprolactam: Harmful if inhaled. Harmful if swallowed.
Formaldehyde: Toxic if swallowed or in contact with skin. Fatal if inhaled.

Acute toxicity estimates

Product	ATE value
Oral	3582,5 mg/kg
Dermal	12000 mg/kg
Inhalation (gases)	154333,3 ppm
Inhalation (vapours)	115,8 mg/l

Product Conclusion/ Summary : May be harmful if swallowed.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Formaldehyde	Skin - Irritant	Rat	-	-	7 days
	Eyes - Irritant	Rabbit	-	-	-
	Skin - Oedema	Rabbit	3	-	24 hours
	Eyes - Cornea opacity	Rat	4	-	7 days

Skin : **butane-1,4-diol:** Based on available data, the classification criteria are not met.
methanol: Based on available data, the classification criteria are not met.
ε-caprolactam: Irritating to skin.
Formaldehyde: Causes burns.

Eyes : **butane-1,4-diol:** Based on available data, the classification criteria are not met.
methanol: Based on available data, the classification criteria are not met.
ε-caprolactam: Irritating to eyes.
Formaldehyde: Causes serious eye damage.

Respiratory : **Formaldehyde:** Irritating to respiratory system.

Product Conclusion/ Summary : Causes mild skin irritation.

Sensitisation

Product/ingredient name	Route of exposure	Species	Result
methanol	Respiratory	Guinea pig	Not sensitizing
		Guinea pig	Not sensitizing
	skin	Mouse	Sensitising
		Guinea pig	Sensitising

Skin : **butane-1,4-diol:** Based on available data, the classification criteria are not met.
methanol: Not sensitizing
Formaldehyde: Sensitising

Respiratory : **butane-1,4-diol:** Based on available data, the classification criteria are not met.
methanol: Not sensitizing
Formaldehyde: Not sensitizing

Product Conclusion/ Summary : May cause an allergic skin reaction.

Chronic toxicity

SECTION 11: Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
butane-1,4-diol methanol	Chronic NOAEL Oral	Rat	225 mg/kg	90 days
	Chronic NOAEL Oral	Rat - Male, Female	466 to 529 mg/ kg Repeated dose	104 weeks
ε-caprolactam	Chronic NOEC Inhalation Vapour	Rat - Male, Female	0,13 mg/l	12 months
	Chronic NOAEC Inhalation Vapour	Rat - Male, Female	1,3 mg/l Continuous	108 days
	Chronic NOAEC Inhalation Vapour	Rat	1,33 mg/l Continuous	17 days; 22,7 hours per day
	Sub-chronic NOAEL Oral	Rat - Male	29 mg/kg	13 weeks; 7 days per week
formaldehyde	Sub-chronic NOAEC Inhalation Vapour	Rat - Male, Female	0,245 mg/l Systemic	13 weeks; 6 hours per day
	Chronic LOAEL Oral	Rat - Male, Female	82 mg/kg	105 weeks
	Chronic NOAEC Inhalation Gas.	Rat - Male, Female	1 ppm	26 weeks
	Sub-acute NOAEC Inhalation Gas.	Rat - Male	2 ppm	6 weeks
	Sub-acute LOAEC Inhalation Gas.	Rat - Male	6 ppm	6 weeks

Mutagenicity

Product/ingredient name	Test	Experiment	Result
formaldehyde	OECD 471	Experiment: In vitro Subject: Bacteria	Positive
	OECD 741	Experiment: In vitro Subject: Mammalian-Animal	Positive

butane-1,4-diol: Based on available data, the classification criteria are not met.

methanol: Based on available data, the classification criteria are not met.

Formaldehyde: Genetic toxicity: Positive.

**Product Conclusion/
Summary**

: Based on available data, the classification criteria are not met.

Carcinogenicity

butane-1,4-diol: Based on available data, the classification criteria are not met.

methanol: Based on available data, the classification criteria are not met.

**Product Conclusion/
Summary**

: May cause cancer. Risk of cancer depends on duration and level of exposure. Formaldehyde is classified as a category 1B carcinogen by EU (Suspected of causing cancer in humans). The classification is mainly based on carcinogenic effects demonstrated in animal experiments, but also on experience from occupational use indicating, but not proving, increased risk of cancer in humans. The actual risk is a rare type of cancer in the nasopharyngeal area (upper part of the throat, behind the nose).

Animal experiments have demonstrated that the cancer risk has a strong link to high and repeated doses of formaldehyde, with an effect threshold at 2 ppm. This is the basis for the derived no effect level (DNEL) for occupational use of 0,3 ppm. Exposure below this level gives limited or no risk of adverse effects.

Reproductive toxicity

butane-1,4-diol: Based on available data, the classification criteria are not met.

methanol: Based on available data, the classification criteria are not met.

Formaldehyde: It is not expected that formaldehyde reaches the reproductive organs and there is no evidence for effects on fertility and gonads in experimental animals after long-term oral or inhalation exposure.

SECTION 11: Toxicological information

Product Conclusion/ Summary : Based on available data, the classification criteria are not met.

Teratogenicity

butane-1,4-diol: Based on available data, the classification criteria are not met.

methanol: Based on available data, the classification criteria are not met.

Formaldehyde: There is no evidence for adverse effects of formaldehyde on embryo and fetal development as dose levels inducing local maternal effects and secondary decrease in body weights and growth.

Product Conclusion/ Summary : Based on available data, the classification criteria are not met.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
butane-1,4-diol	Category 3	Not applicable.	Narcotic effects
methanol	Category 1	All	central nervous system (CNS) and optic nerve
ε-caprolactam	Category 3	Not applicable.	Respiratory tract irritation
formaldehyde	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Based on available data, the classification criteria are not met.

Aspiration hazard

Product Conclusion/ Summary : Based on available data, the classification criteria are not met.

Interactive effects : No specific data.

Other information : No specific data.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
Prefere 4535 butane-1,4-diol	Acute EC50 >1000 mg/l Marine water	Algae - Skeletonema costatum	72 hours
	EC50 >500 mg/l	Algae	72 hours
methanol	IC50 813 mg/l	Daphnia	48 hours
	LC50 >30000 mg/l	Fish	96 hours
	EC50 22000 mg/l Fresh water	Algae - Selenastrum capricornutum	96 hours
	IC50 8800 mg/l Fresh water	Micro-organism - Nitrosomonas sp.	Static
	Acute EC50 >10000 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 15400 mg/l Fresh water	Fish - Lepomis macrochirus	96 hours
ε-caprolactam	EC50 >1000 mg/l Fresh water	Algae - Pseudokirchnerella subcapitata	72 hours
	EC50 4240 mg/l Fresh water	Micro-organism - Pseudomonas putida	Static
	Acute EC50 >1000 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
			Static

SECTION 12: Ecological information

formaldehyde	Acute LC50 >100 mg/l Fresh water	Fish - <i>Oryzias latipes</i>	96 hours
	Chronic NOEC 100 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	Semi-static 21 days
	EC50 4,89 mg/l Fresh water	Algae - <i>Scenedesmus subspicatus</i>	Semi-static 72 hours
	Acute EC50 5,8 mg/l Fresh water Acute LC50 6,7 mg/l Fresh water	Daphnia - <i>Daphnia pulex</i> Fish - <i>Morone saxatilis</i>	48 hours 96 hours Static

Conclusion/Summary : **methanol**: No known significant effects or critical hazards.
Formaldehyde: Toxic to aquatic organisms.

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
Prefere 4535 butane-1,4-diol methanol	-	15 % - Inherent - 28 days	-	-
	-	100 % - Readily - 14 days	-	-
	-	83 to 91 % - Readily - 3 days	-	Fresh water Sediment
	-	71 to 83 % - Readily - 5 days	BOD/ThOD	Sewage
	-	69 to 97 % - 5 days	O ₂ Consumption	Marine water
	-	53,4 % - 5 days	-	-
ε-caprolactam	-	46,3 % - 5 days	-	-
	-	82 % - Readily - 14 days	-	-
	OECD 301C Ready Biodegradability - Modified MITI Test (I)			
formaldehyde	Anaerobic biodegradation OECD 303 A	100 % - 4 days	Degradation	Anaerobic sludge
		99,5 % - 160 days	Degradation	Activated sludge Industrial Adapted
	OECD 301 C	97 % - Readily - 14 days	TOC removal	-
	OECD 301 D	90 % - Readily - 28 days	30 mg/l O ₂ Consumption	-

Conclusion/Summary : **methanol**: Readily biodegradable
ε-caprolactam: Readily biodegradable
Formaldehyde: Readily biodegradable

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Prefere 4535 butane-1,4-diol methanol ε-caprolactam formaldehyde	-	-	Inherent
	-	-	Readily
	-	50%; 17.2 day(s)	Readily
	-	-	Readily
	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Prefere 4535 butane-1,4-diol methanol ε-caprolactam formaldehyde	<0	-	low
	-0,88	3,16	low
	-0,77	<10	low
	0,12	-	low
	0,35	0,396	low

12.4 Mobility in soil

SECTION 12: Ecological information

Soil/water partition coefficient (K_{oc}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

PBT : Not applicable.

vPvB : Not applicable.

12.6 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste : Yes.

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

SECTION 14: Transport information

14.6 Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code : Not available.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Restricted to professional users.

Other EU regulations

Industrial emissions (integrated pollution prevention and control) - Air

Not listed

Industrial emissions (integrated pollution prevention and control) - Water

Not listed

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

National regulations

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : Not determined.

SECTION 15: Regulatory information

Canada	: <input checked="" type="checkbox"/> Not determined.
China	: <input checked="" type="checkbox"/> Not determined.
Europe	: All components are listed or exempted.
Japan	: <input checked="" type="checkbox"/> Japan inventory (ENCS): Not determined. <input checked="" type="checkbox"/> Japan inventory (ISHL): Not determined.
Malaysia	: <input checked="" type="checkbox"/> Not determined.
New Zealand	: <input checked="" type="checkbox"/> Not determined.
Philippines	: <input checked="" type="checkbox"/> Not determined.
Republic of Korea	: <input checked="" type="checkbox"/> Not determined.
Taiwan	: <input checked="" type="checkbox"/> Not determined.
Thailand	: <input checked="" type="checkbox"/> Not determined.
Turkey	: <input checked="" type="checkbox"/> Not determined.
United States	: <input checked="" type="checkbox"/> Not determined.
Viet Nam	: <input checked="" type="checkbox"/> Not determined.

15.2 Chemical safety assessment : This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 DNEL = Derived No Effect Level
 EUH statement = CLP-specific Hazard statement
 PNEC = Predicted No Effect Concentration
 RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Skin Sens. 1, H317 Carc. 1B, H350	Calculation method Calculation method

Full text of abbreviated H statements

<input checked="" type="checkbox"/> H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H370	Causes damage to organs.

Full text of classifications [CLP/GHS]

SECTION 16: Other information

Acute Tox. 2, H330	ACUTE TOXICITY (inhalation) - Category 2
Acute Tox. 3, H301	ACUTE TOXICITY (oral) - Category 3
Acute Tox. 3, H311	ACUTE TOXICITY (dermal) - Category 3
Acute Tox. 3, H331	ACUTE TOXICITY (inhalation) - Category 3
Acute Tox. 4, H302	ACUTE TOXICITY (oral) - Category 4
Acute Tox. 4, H332	ACUTE TOXICITY (inhalation) - Category 4
Carc. 1B, H350	CARCINOGENICITY - Category 1B
Eye Dam. 1, H318	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
Eye Irrit. 2, H319	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Flam. Liq. 2, H225	FLAMMABLE LIQUIDS - Category 2
Muta. 2, H341	GERM CELL MUTAGENICITY - Category 2
Skin Corr. 1B, H314	SKIN CORROSION/IRRITATION - Category 1B
Skin Irrit. 2, H315	SKIN CORROSION/IRRITATION - Category 2
Skin Sens. 1, H317	SKIN SENSITISATION - Category 1
STOT SE 1, H370	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 1
STOT SE 3, H335	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3
STOT SE 3, H336	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Narcotic effects) - Category 3

Date of issue/ Date of revision : 26.04.2018

Date of previous issue : 13.11.2015

Previous product name : Not available.

Version : 7