

Roto Z Fluid

Atlas Copco Kompressoren und Drucklufttechnik GmbH

Version No: 1.6

Safety Data Sheet (Conforms to Regulation (EU) No 2015/830)

Issue Date: **26/07/2018** Print Date: **27/07/2018** S.REACH.DEU.EN

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

1.1. Product Identifier

Product name	Roto Z Fluid
Synonyms	Roto Z.
Other means of identification	122

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

Relevant identified uses	Compressor oil.
Uses advised against	Not Applicable

1.3. Details of the supplier of the safety data sheet

Registered company name	Atlas Copco Kompressoren und Drucklufttechnik GmbH	Atlas Copco Airpower NV
Address	Langemarckstrasse 35, Essen D-45141 Germany	Boomsesteenweg 957 Wilrijk B2610 Belgium
Telephone	+49(0)173 2883871	+32 3 870 2111
Fax	+49(0)201 21 69 17	+32 3 870 2903
Website	www.atlascopco.com	www.atlascopco.com
Email	info.lubricants.cts@atlascopco.com	info.lubricants.cts@atlascopco.com

1.4. Emergency telephone number

· · · · · · · · · · · · · · · · · · ·	<u> </u>		
Association / Organisation	Chemwatch	Chemwatch	
Emergency telephone numbers	+800 2436 2255	+800 2436 2255	
Other emergency telephone numbers	Not Available	Not Available	

SECTION 2 HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification according to regulation (EC) No 1272/2008	Not Applicable
[CLP] ^[1]	

2.2. Label elements

Hazard pictogram(s)	Not Applicable
SIGNAL WORD	NOT APPLICABLE

Hazard statement(s)

Not Applicable

Supplementary statement(s)

• •	•	٠,	
		EUH210	Safety data sheet available on request.

Precautionary statement(s) Prevention

Not Applicable

Precautionary statement(s) Response

Not Applicable

Precautionary statement(s) Storage

Not Applicable

Precautionary statement(s) Disposal

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Not Applicable

REACh - Art.57-59: The mixture does not contain Substances of Very High Concern (SVHC) at the SDS print date.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

3.1.Substances

See 'Composition on ingredients' in Section 3.2

3.2.Mixtures

1.CAS No 2.EC No 3.Index No 4.REACH No	%[weight]	Name	Classification according to regulation (EC) No 1272/2008 [CLP]
1. Not Available 2. Not Available 3. Not Available 4. Not Available	0.1-90	Interchangeable low viscosity base oil (<20.5 cSt @ 40C)	Aspiration Hazard Category 1; H304 ^[1]
		* contains one or more of the following CAS-numbers (REACH registration numbers):	
		64742-53-6 (01-2119480375-34), 64742-54-7 (01-2119484627-25),	
		64742-55-8 (01-2119487077-29), 64742-56-9 (01-2119480132-48),	
		64742-65-0 (01-2119471299-27), 68037-01-4 (01-2119486452-34),	
		72623-86-0 (01-2119474878-16), 72623-87-1 (01-2119474889-13),	
		8042-47-5 (01-2119487078-27), 848301-69-9 (01-0000020163-82)	
Legend:	1. Classified l available	by Chemwatch; 2. Classification drawn from Regulation (EU) No 1272/2008 - A	nnex VI; 3. Classification drawn from C&L * EU IOELVs

SECTION 4 FIRST AID MEASURES

4.1. Description of first aid measures

Eye Contact	If this product comes in contact with eyes: • Wash out immediately with water. • If irritation continues, seek medical attention. • Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin or hair contact occurs: ► Flush skin and hair with running water (and soap if available). ► Seek medical attention in event of irritation.
Inhalation	 If fumes, aerosols or combustion products are inhaled remove from contaminated area. Other measures are usually unnecessary.
Ingestion	 Immediately give a glass of water. First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor. If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11

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

Treat symptomatically.

- ▶ Heavy and persistent skin contamination over many years may lead to dysplastic changes. Pre-existing skin disorders may be aggravated by exposure to this product.
- In general, emesis induction is unnecessary with high viscosity, low volatility products, i.e. most oils and greases.
- ▶ High pressure accidental injection through the skin should be assessed for possible incision, irrigation and/or debridement.

NOTE: Injuries may not seem serious at first, but within a few hours tissue may become swollen, discoloured and extremely painful with extensive subcutaneous necrosis. Product may be forced through considerable distances along tissue planes.

SECTION 5 FIREFIGHTING MEASURES

5.1. Extinguishing media

- ► Foam.
- Dry chemical powder.
- ▶ BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog Large fires only.
- ▶ Do not use a water jet to fight fire.

5.2. Special hazards arising from the substrate or mixture

▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result Fire Incompatibility

5.3. Advice for firefighters

Fire Fighting

- Alert Fire Brigade and tell them location and nature of hazard.
- ▶ Wear full body protective clothing with breathing apparatus.
- ▶ Prevent, by any means available, spillage from entering drains or water course.

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	► Use water delivered as a fine spray to control fire and cool adjacent area.
Fire/Explosion Hazard	 Combustible. Slight fire hazard when exposed to heat or flame. Heating may cause expansion or decomposition leading to violent rupture of containers. On combustion, may emit toxic furnes of carbon monoxide (CO). Combustion products include: carbon dioxide (CO2) other pyrolysis products typical of burning organic material. CARE: Water in contact with hot liquid may cause foaming and a steam explosion with wide scattering of hot oil and possible severe burns. Foaming may cause overflow of containers and may result in possible fire.

SECTION 6 ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

See section 8

6.2. Environmental precautions

See section 12

6.3. Methods and material for containment and cleaning up

3 -F		
Minor Spills	Slippery when spilt. Framove all ignition sources. Clean up all spills immediately. Avoid breathing vapours and contact with skin and eyes. Control personal contact with the substance, by using protective equipment.	
Major Spills	Slippery when spilt. Moderate hazard. ► Clear area of personnel and move upwind. ► Alert Fire Brigade and tell them location and nature of hazard. ► Wear breathing apparatus plus protective gloves.	

6.4. Reference to other sections

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

7.1. Precautions for safe handling

Safe handling	 Avoid all personal contact, including inhalation. Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area. Prevent concentration in hollows and sumps. 		
Fire and explosion protection	See section 5		
Other information	 Store in original containers. Keep containers securely sealed. No smoking, naked lights or ignition sources. Store in a cool, dry, well-ventilated area. 		

7.2. Conditions for safe storage, including any incompatibilities

Suitable container	Metal can or drum Packaging as recommended by manufacturer. Check all containers are clearly labelled and free from leaks.
Storage incompatibility	Avoid contamination of water, foodstuffs, feed or seed. CARE: Water in contact with heated material may cause foaming or a steam explosion with possible severe burns from wide scattering of hot material. Resultant overflow of containers may result in fire. Avoid reaction with oxidising agents

7.3. Specific end use(s)

See section 1.2

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

DERIVED NO EFFECT LEVEL (DNEL)

Not Available

PREDICTED NO EFFECT LEVEL (PNEC)

Not Available

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Ingredient Material name TWA STEL Source Peak Notes

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Germany Recommended Exposure Limits - MAK Values (English)	oil mist, mineral	mineral oil		5 mg/m3	Not Available	Not Availabl	е	Not Available
EMERGENCY LIMITS								
Ingredient	Material name		TEEL-1		TEEL-2		TEEL-3	
Roto Z Fluid	Not Available		Not Available		Not Available		Not Availa	able
Ingredient	Original IDLH				Revised IDLH			
Interchangeable low viscosity base oil (<20.5 cSt @ 40C)	Not Available				Not Available			

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard 'physically' away from the worker and ventilation that strategically 'adds' and 'removes' air in the work environment.

8.2.2. Personal protection







Eye and face protection

- Safety glasses with side shields
- Chemical goggles
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience.

Skin protection

See Hand protection below

Hands/feet protection

Wear general protective gloves, eg. light weight rubber gloves, nitrile gloves.

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

Personal hygiene is a key element of effective hand care.

Body protection

See Other protection below

Other protection

No special equipment needed when handling small quantities.

OTHERWISE:

- Overalls.
- Barrier cream.
- Eyewash unit.

Respiratory protection

No respiratory protection is required under normal use.

Otherwise:

Type A-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

8.2.3. Environmental exposure controls

See section 12

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Amber liquid, slight hydrocarbon odour.		
Physical state	Liquid	Relative density (Water = 1)	0.860 @ 15 C
Odour	slight hydrocarbon	Partition coefficient n-octanol / water	>6
Odour threshold	Not Available	Auto-ignition temperature (°C)	320
pH (as supplied)	Not Applicable	Decomposition temperature	Not Available
Melting point / freezing point (°C)	-30	Viscosity (cSt)	68 @ 40 C
Initial boiling point and boiling range (°C)	>280	Molecular weight (g/mol)	Not Applicable
Flash point (°C)	247	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	10	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	1	Volatile Component (%vol)	Not Available

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Vapour pressure (kPa)	<0.0005 @ 20 C	Gas group	Not Available
Solubility in water (g/L)	Immiscible	pH as a solution (1%)	Not Applicable
Vapour density (Air = 1)	>1	VOC g/L	0

9.2. Other information

Not Available

SECTION 10 STABILITY AND REACTIVITY

10.1.Reactivity	See section 7.2
10.2. Chemical stability	Product is considered stable and hazardous polymerisation will not occur.
10.3. Possibility of hazardous reactions	See section 7.2
10.4. Conditions to avoid	See section 7.2
10.5. Incompatible materials	See section 7.2
10.6. Hazardous decomposition products	See section 5.3

SECTION 11 TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Inhaled	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Inhalation hazard is increased at higher temperatures. Not normally a hazard due to non-volatile nature of product				
Ingestion	The material is not thought to produce adverse health effects following ingestion.				
Skin Contact	The liquid may be able to be mixed with fats or oils and may degrease the skin, producing a skin reaction described as non-allergic contact dermatitis. The material is unlikely to produce an irritant dermatitis as described in EC Directives. The material may accentuate any pre-existing dermatitis condition. Open cuts, abraded or irritated skin should not be exposed to this material. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.				
Eye	Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).				
Chronic	Long-term exposure to the product is not thought to produce chronic effects a nevertheless exposure by all routes should be minimised as a matter of course	,	by EC Directives using animal models);		
Roto Z Fluid	TOXICITY Dermal (Rabbit) LD50: 5000 mg/kg ^[2] Oral (rat) LD50: 5000 mg/kg ^[2]		IRRITATION Not Available		
Interchangeable low viscosity base oil (<20.5 cSt @ 40C)	TOXICITY Not Available	IRRITATION Not Available			
Legend:	Value obtained from Europe ECHA Registered Substances - Acute toxicity *Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic E				

 $The \ materials \ included \ in \ the \ Lubricating \ Base \ Oils \ category \ are \ related \ from \ both \ process \ and \ physical-chemical \ perspectives;$

The potential toxicity of a specific distillate base oil is inversely related to the severity or extent of processing the oil has undergone, since:

- \bullet The adverse effects of these materials are associated with undesirable components, and
- The levels of the undesirable components are inversely related to the degree of processing;
- Distillate base oils receiving the same degree or extent of processing will have similar toxicities;
- The potential toxicity of residual base oils is independent of the degree of processing the oil receives.
- The reproductive and developmental toxicity of the distillate base oils is inversely related to the degree of processing.

Interchangeable low viscosity base oil (<20.5 cSt @ 40C)

Unrefined & mildly refined distillate base oils contain the highest levels of undesirable components, have the largest variation of hydrocarbon molecules and have shown the highest potential cancer-causing and mutation-causing activities. Highly and severely refined distillate base oils are produced from unrefined and mildly refined oils by removing or transforming undesirable components.

For highly and severely refined distillate base oils:

In animal studies, the acute, oral, semilethal dose is >5g/kg body weight and the semilethal dose by skin contact is >2g/kg body weight. The semilethal concentration for inhalation is 2.18 to >4 mg/L. The materials have varied from "non-irritating" to "moderately irritating" when tested for skin and eye irritation. Testing for sensitisation has been negative.

Acute Toxicity	×	Carcinogenicity	0
Skin Irritation/Corrosion	0	Reproductivity	0
Serious Eye Damage/Irritation	0	STOT - Single Exposure	0

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Not Available to make classification

Respiratory or Skin sensitisation	\circ	STOT - Repeated Expo	sure	0	
Mutagenicity	0	Aspiration Ha	azard	0	
		Legend:	Legend: X – Data available but does not fill the criteria for classific		

SECTION 12 ECOLOGICAL INFORMATION

12.1. Toxicity

Roto Z Fluid	ENDPOINT	TEST DURATION (HR)	SPECIES		VALUE	SOURCE
	EC50	0	Algae/Plant Other >100mg/L		8	
	EC50	0	Crustacea Other	Crustacea Other >100mg/L		8
	EC50	0	Fish Other	Fish Other >100r		8
Interchangeable low viscosity	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE		SOURCE
base oil (<20.5 cSt @ 40C)	Not Available	Not Available	Not Available	Not Ava	ailable	Not Available

Legend:

Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

When spilled this product may act as a typical oil, causing a film, sheen, emulsion or sludge at or beneath the surface of the body of water. The oil film on water surface may physically affect the aquatic organisms, due to the interruption of the

oxygen transfer between the air and the water

Oils of any kind can cause:

- representation of the drowning of water-fowl due to lack of buoyancy, loss of insulating capacity of feathers, starvation and vulnerability to predators due to lack of mobility
- ▶ lethal effects on fish by coating gill surfaces, preventing respiration
- ▶ asphyxiation of benthic life forms when floating masses become engaged with surface debris and settle on the bottom and
- adverse aesthetic effects of fouled shoreline and beaches

In case of accidental releases on the soil, a fine film is formed on the soil, which prevents the plant respiration process and the soil particle saturation. It may cause deep water infestation.

12.2. Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
	Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but contains components that may persist in the environment.	No Data available for all ingredients

12.3. Bioaccumulative potential

Ingredient	Bioaccumulation
	Contains components with the potential to bioaccumulate.

12.4. Mobility in soil

Ingredient	Mobility
	Liquid under most environmental conditions. If it enters soil, it will adsorb to soil particles and will not be mobile.

12.5.Results of PBT and vPvB assessment - The mixture does not contain any REACH registered substances that are assessed to be a PBT or a vPvR

	P	В	Т
Relevant available data	Not Available	Not Available	Not Available
PBT Criteria fulfilled?	Not Available	Not Available	Not Available

12.6. Other adverse effects

Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

Poorly soluble mixture. May cause physical fouling of aquatic organisms.

Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l. [Manufacturer]

SECTION 13 DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Product / Packaging disposal

Legislation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- ► Reduction
- ► Reuse

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Recycling
Disposal (if all else fails)
This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use.
DO NOT allow wash water from cleaning or process equipment to enter drains.
It may be necessary to collect all wash water for treatment before disposal.
In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
Where in doubt contact the responsible authority.
Recycle wherever possible or consult manufacturer for recycling options.
Consult State Land Waste Authority for disposal.
Bury or incinerate residue at an approved site.
Recycle containers if possible, or dispose of in an authorised landfill.

Waste treatment options

Not Available

Not Available

SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant NO

Land transport (ADR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. UN number	Not Applicable		
14.2. UN proper shipping name	Not Applicable	Not Applicable	
14.3. Transport hazard class(es)	Class Not Applicable Subrisk Not Applicable		
14.4. Packing group	Not Applicable		
14.5. Environmental hazard	Not Applicable		
14.6. Special precautions for user	Hazard identification (Kemler) Classification code	Not Applicable Not Applicable	
	Hazard Label	Not Applicable	
	Special provisions	Not Applicable	
	Limited quantity	Not Applicable	

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. UN number	Not Applicable			
14.2. UN proper shipping name	Not Applicable	Not Applicable		
14.3. Transport hazard class(es)	ICAO/IATA Class ICAO / IATA Subrisk ERG Code	Not Applicable Not Applicable Not Applicable		
14.4. Packing group	Not Applicable			
14.5. Environmental hazard	Not Applicable			
	Special provisions		Not Applicable	
	Cargo Only Packing Instructions		Not Applicable	
14.6. Special precautions for user	Cargo Only Maximum Qty / Pack		Not Applicable	
	Passenger and Cargo Packing Instructions		Not Applicable	
	Passenger and Cargo Maximum Qty / Pack		Not Applicable	
	Passenger and Cargo Limited Quantity Packing Instructions		Not Applicable	
	Passenger and Cargo Limited Maximum Qty / Pack		Not Applicable	

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. UN number	Not Applicable	
14.2. UN proper shipping name	Not Applicable	
14.3. Transport hazard class(es)	IMDG Class Not Applicable IMDG Subrisk Not Applicable	
14.4. Packing group	Not Applicable	
14.5. Environmental hazard	Not Applicable	
14.6. Special precautions for user	EMS Number Not Applicable Special provisions Not Applicable Limited Quantities Not Applicable	

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Inland waterways transport (ADN): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. UN number	Not Applicable	
14.2. UN proper shipping name	Not Applicable	
14.3. Transport hazard class(es)	Not Applicable Not Applicable	
14.4. Packing group	Not Applicable	
14.5. Environmental hazard	Not Applicable	
14.6. Special precautions for user	Classification code Not Applicable Special provisions Not Applicable	
	Limited quantity Not Applicable	
	Equipment required Not Applicable	
	Fire cones number Not Applicable	
	Special provisions Not Applicable Limited quantity Not Applicable Equipment required Not Applicable	

14.7. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

SECTION 15 REGULATORY INFORMATION

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

INTERCHANGEABLE LOW VISCOSITY BASE OIL (<20.5 CST @ 40C)(NOT AVAILABLE) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Not Applicable

This safety data sheet is in compliance with the following EU legislation and its adaptations - as far as applicable -: Directives 98/24/EC, - 92/85/EEC, - 94/33/EC, - 2008/98/EC, - 2010/75/EU; Commission Regulation (EU) 2015/830; Regulation (EC) No 1272/2008 as updated through ATPs.

15.2. Chemical safety assessment

For further information please look at the Chemical Safety Assessment and Exposure Scenarios prepared by your Supply Chain if available.

15.3. Classification of Substances and Mixtures into Water Hazard Classes

PREPARATION IS WGK 1

Name	WGK	Score	Source
Interchangeable low viscosity base oil (<20.5 cSt @ 40C)	1	1	Calculated

National Inventory Status

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Υ
Canada - NDSL	Y
China - IECSC	Υ
Europe - EINEC / ELINCS / NLP	Υ
Japan - ENCS	Υ
Korea - KECI	Υ
New Zealand - NZIoC	Υ
Philippines - PICCS	Υ
USA - TSCA	Υ
Legend:	Y = All ingredients are on the inventory N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

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Full text Risk and Hazard codes

H304	May be fatal if swallowed and enters airways.

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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For detailed advice on Personal Protective Equipment, refer to the following EU CEN Standards:

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EN 166 Personal eye-protection

EN 340 Protective clothing

EN 374 Protective gloves against chemicals and micro-organisms

EN 13832 Footwear protecting against chemicals

EN 133 Respiratory protective devices

Definitions and abbreviations

 $\mbox{PC-TWA: Permissible Concentration-Time Weighted Average} \label{eq:pc-twa}$

PC - STEL: Permissible Concentration-Short Term Exposure Limit

IARC: International Agency for Research on Cancer

ACGIH: American Conference of Governmental Industrial Hygienists

STEL: Short Term Exposure Limit

TEEL: Temporary Emergency Exposure Limit。

IDLH: Immediately Dangerous to Life or Health Concentrations

OSF: Odour Safety Factor

NOAEL :No Observed Adverse Effect Level

LOAEL: Lowest Observed Adverse Effect Level

TLV: Threshold Limit Value LOD: Limit Of Detection OTV: Odour Threshold Value

BCF: BioConcentration Factors BEI: Biological Exposure Index

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