

This safety data sheet was created pursuant to the requirements of:
UK REACH Regulations (SI 2019/758 as amended)

Supersedes date 27-Jul-2020

Revision date 16-Mar-2026

Revision Number 5

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

1.1. Product identifier

Product Code(s)	51370
Safety data sheet number	51370
Product Name	1,3-DIOXOLANE TECHNICAL GRADE
EC Number	211-463-5
CAS No	646-06-0
Synonyms	DIOXOLANE TECH 3%
Pure substance/mixture	Substance
Contains 1,3-DIOXOLANE	
Molecular weight	74.08

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

Recommended use	Industrial application Chemical intermediate Laboratory chemicals Solvent paint Paint remover
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1.3. Details of the supplier of the safety data sheet

Supplier

Univar Solutions UK Ltd
Aquarius House
6 Mid Point Business Park
Bradford
GBR

For further information, please contact

E-mail address	SDS.EMEA@univarsolutions.com
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306

1.4. Emergency telephone number

Emergency Telephone	SGS - +32 (0)3 575 55 55 (24h)
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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Flammable liquids	Category 2 - (H225)
Serious eye damage/eye irritation	Category 1 - (H318)
Reproductive toxicity	Category 1B - (H360FD)

2.2. Label elements

Contains 1,3-DIOXOLANE

**Signal word**

Danger

Hazard statements

H318 - Causes serious eye damage

H360FD - May damage fertility. May damage the unborn child

H225 - Highly flammable liquid and vapour

Precautionary statements

P201 - Obtain special instructions before use

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor

P403 + P235 - Store in a well-ventilated place. Keep cool

2.3. Other hazards

No information available.

SECTION 3: Composition/information on ingredients**3.1 Substances**

Chemical name	Weight-%	EC No (EU Index No)	UK REACH registration number	Classification according to GB CLP (SI 2020/1567 as amended)	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)
1,3-DIOXOLANE 646-06-0	90 - 100%	211-463-5	-	Flam. Liq. 2 (H225) Eye Dam. 1 (H318) Repr. 1B (H360FD)	-	-	-
METHANOL 67-56-1	0 - 10%	200-659-6 (603-001-00-X)	-	Flam. Liq. 2 (H225) Acute Tox. 3 (H301) Acute Tox. 3 (H311)	STOT SE 1 :: C>=10% STOT SE 2 ::	-	-

				Acute Tox. 3 (H331) STOT SE 1 (H370)	3%≤C<10%		
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Full text of H- and EUH-phrases: see section 16

This product does not contain candidate substances of very high concern at a concentration $\geq 0.1\%$ (UK REACH Article 59)

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice	Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.
Inhalation	Remove to fresh air. Get medical attention immediately if symptoms occur.
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Get immediate medical attention. Remove contact lenses, if present and easy to do. Continue rinsing.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a doctor.
Self-protection of the first aider	Remove all sources of ignition. Use personal protective equipment as required. See section 8 for more information. Avoid contact with skin, eyes or clothing.

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

Symptoms	Burning sensation.
Eyes	Causes serious eye damage. Burning sensation.

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

Note to doctors	Treat symptomatically.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media	Dry chemical. Carbon dioxide (CO ₂). Water spray. Alcohol resistant foam.
Large Fire	CAUTION: Use of water spray when fighting fire may be inefficient.
Unsuitable extinguishing media	Do not scatter spilled material with high pressure water streams.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical	Risk of ignition. Keep product and empty container away from heat and sources of ignition. In the event of fire, cool tanks with water spray. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Hazardous combustion products	Carbon oxides.

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Use personal protective equipment as required. See section 8 for more information. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Pay attention to flashback. Take precautionary measures against static discharges.

Other information Ventilate the area. Refer to protective measures listed in Sections 7 and 8.

For emergency responders Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions Refer to protective measures listed in Sections 7 and 8. Prevent further leakage or spillage if safe to do so. Prevent product from entering drains.

6.3. Methods and material for containment and cleaning up

Methods for containment Stop leak if you can do it without risk. Do not touch or walk through spilled material. A vapour suppressing foam may be used to reduce vapours. Dyke far ahead of spill to collect run-off water. Keep out of drains, sewers, ditches and waterways. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

Methods for cleaning up Take precautionary measures against static discharges. Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labelled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections See section 8 for more information. See section 13 for more information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling Use personal protection equipment. Avoid breathing vapours or mists. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use with local exhaust ventilation. Use spark-proof tools and explosion-proof equipment. Keep in an area equipped with sprinklers. Use according to package label instructions. Avoid contact with skin, eyes or clothing. Remove contaminated clothing and shoes.

General hygiene considerations Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static

electricity). Keep in properly labelled containers. Do not store near combustible materials. Store in accordance with the particular national regulations.

7.3. Specific end use(s)

Specific use(s)

See section 1 for more information.

Risk Management Methods (RMM) The information required is contained in this Safety Data Sheet.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

Chemical name	United Kingdom
METHANOL 67-56-1	TWA: 200 ppm TWA: 266 mg/m ³ STEL: 250 ppm STEL: 333 mg/m ³ Sk*

Biological occupational exposure limits This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

Derived No Effect Level (DNEL) - Workers

Chemical name	Oral	Dermal	Inhalation
1,3-DIOXOLANE 646-06-0		0.93 mg/kg/day [4] [6]	3.26 mg/m ³ [4] [6]
METHANOL 67-56-1		20 mg/kg bw/day [4] [6] 20 mg/kg bw/day [4] [7]	130 mg/m ³ [4] [6] 130 mg/m ³ [4] [7] 130 mg/m ³ [5] [6] 130 mg/m ³ [5] [7]

[4] Systemic health effects.
[5] Local health effects.
[6] Long term.
[7] Short term.

Derived No Effect Level (DNEL) - General Public

Chemical name	Oral	Dermal	Inhalation
1,3-DIOXOLANE 646-06-0	0.33 mg/kg/day [4] [6]	0.33 mg/kg/day [4] [6]	1.48 mg/kg/day [4] [6]
METHANOL 67-56-1	4 mg/kg bw/day [4] [6] 4 mg/kg bw/day [4] [7]	4 mg/kg bw/day [4] [6] 4 mg/kg bw/day [4] [7]	26 mg/m ³ [4] [6] 26 mg/m ³ [4] [7] 26 mg/m ³ [5] [6] 26 mg/m ³ [5] [7]

[4] Systemic health effects.
[5] Local health effects.
[6] Long term.

[7] Short term.

Predicted No Effect Concentration (PNEC)

Chemical name	Freshwater	Freshwater (intermittent release)	Marine water	Marine water (intermittent release)	Air
1,3-DIOXOLANE 646-06-0	19.7 mg/l	100.0 mg/L	1.97 mg/l		
METHANOL 67-56-1	20.8 mg/L	1540 mg/L	2.08 mg/L		

Chemical name	Freshwater sediment	Marine sediment	Sewage treatment	Soil	Food chain
1,3-DIOXOLANE 646-06-0	77.7 mg/kg	7.77 mg/kg	1 mg/L	2.62 mg/kg	
METHANOL 67-56-1	77 mg/kg sediment dw	7.7 mg/kg sediment dw	100 mg/L	100 mg/kg soil dw	

8.2. Exposure controls

Engineering controls No information available.

Personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles). According to EN 16321-1.

Hand protection Ensure that the breakthrough time of the glove material is not exceeded. Refer to glove supplier for information on breakthrough time for specific gloves. Gloves must conform to standard EN 374.

Gloves			
Duration of contact	PPE - Glove material	Glove thickness	Break through time
Short term	PVC	1.2 mm	> 60 minutes

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron. Antistatic boots.

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.
Type A.

General hygiene considerations Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state Liquid
Appearance Liquid
Colour Colourless

Odour Mild.
Odour threshold No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Melting point / freezing point	< -90.0 °C	
Initial boiling point and boiling range	76.0 °C	OECD 103.
Flammability		No information available.
Flammability Limit in Air		No information available.
Upper flammability or explosive limits	30.5%	
Lower flammability or explosive limits	2.3%	
Flash point	< 2.5 °C	
Autoignition temperature	250 °C	
Decomposition temperature		No information available.
pH		No information available.
pH (as aqueous solution)		No information available.
Kinematic viscosity	0.56 mm ² /s	25.0 °C.
Dynamic viscosity		No information available.
Water solubility	Soluble in water	
Solubility(ies)		No information available.
Partition coefficient	log Kow: -0.37	@ 20.0 °C.
Vapour pressure	101 hPa	@ 20.0 °C.
Relative density	1.06	20.0 °C.
Bulk density	1060 kg/m ³	No information available
Liquid Density	No information available	No information available
Relative vapour density		No information available.
Particle characteristics		No information available.
Particle Size	No information available	
Particle Size Distribution	No information available	
Explosive properties	No information available	
Oxidising properties	No information available	
9.2. Other information		
Molecular weight	74.08	
Refractive Index	1.401 0.29	

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity Stable under recommended storage conditions.

10.2. Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to mechanical impact None.

Sensitivity to static discharge Yes.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions None under normal processing.

10.4. Conditions to avoid

Conditions to avoid Heat, flames and sparks.

10.5. Incompatible materials

Incompatible materials Strong acids. Strong oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products Carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure

Product Information

Inhalation	May cause irritation.
Eye contact	Causes serious eye damage.
Skin contact	May cause slight irritation.
Ingestion	Gastrointestinal discomfort.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Redness. Burning. May cause blindness.

Acute toxicity

Numerical measures of toxicity

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
1,3-DIOXOLANE	> 2000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	= 68.4 mg/L (Rat) 4 h
METHANOL	300 mg/kg	300 mg/kg	3 mg/L

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation	No information available.
Serious eye damage/eye irritation	Causes serious eye damage.
Respiratory or skin sensitisation	No information available.
Germ cell mutagenicity	No information available.
Carcinogenicity	No information available.
Reproductive toxicity	May damage fertility or the unborn child.

The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as reproductive toxins.

Chemical name	United Kingdom
1,3-DIOXOLANE	Repr. 1B

STOT - single exposure No information available.

STOT - repeated exposure No information available.

Aspiration hazard No information available.

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity Not considered to be harmful to aquatic life.

1,3-DIOXOLANE (646-06-0)

Method	Species	Endpoint type	Effective dose	Exposure time	Results
OECD Test No. 203: Fish, Acute Toxicity Test	Lepomis macrochirus	LC50	>95.4 mg/L	96 hours	
OECD Test No. 202: Daphnia sp., Acute Immobilisation Test	Daphnia magna	EC50	>772 mg/L	48 hours	
OECD Test No. 201: Freshwater Algae and Cyanobacteria, Growth Inhibition Test	Selenastrum capricornutum	NOEC	877 mg/L	72 hours	
OECD Test No. 201: Freshwater Algae and Cyanobacteria, Growth Inhibition Test	Selenastrum capricornutum	ErC50	>877 mg/L	72 hours	

METHANOL (67-56-1)

Method	Species	Endpoint type	Effective dose	Exposure time	Results
	Pimephales promelas***	LC50***	28100 mg/L***	96 hours***	

12.2. Persistence and degradability

Persistence and degradability Not readily biodegradable.

1,3-DIOXOLANE (646-06-0)

Method	Exposure time	Value	Results
OECD Test No. 301C: Ready Biodegradability: Modified MITI Test (I) (TG 301 C)		20% Biodegradation	

12.3. Bioaccumulative potential

Bioaccumulation No information available.

Component Information

Chemical name	Partition coefficient
1,3-DIOXOLANE	-0.35
METHANOL	-0.77

12.4. Mobility in soil

Mobility in soil Soluble in water.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment The product does not contain any substance(s) classified as PBT or vPvB.

Chemical name	PBT and vPvB assessment
1,3-DIOXOLANE	The substance is not PBT / vPvB
METHANOL	The substance is not PBT / vPvB

12.6. Other adverse effects

No information available.

SECTION 13: Disposal considerations**13.1. Waste treatment methods**

Waste from residues/unused products Should not be released into the environment. Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Empty containers pose a potential fire and explosion hazard. Do not cut, puncture or weld containers.

SECTION 14: Transport information**IATA**

14.1 UN number or ID number UN1166
 14.2 UN proper shipping name DIOXOLANE
 14.3 Transport hazard class(es) 3
 14.4 Packing group II
 14.5 Environmental hazards No
 14.6 Special precautions for user
 Special Provisions None
 ERG Code 3L

IMDG

14.1 UN number or ID number UN1166
 14.2 UN proper shipping name DIOXOLANE
 14.3 Transport hazard class(es) 3
 14.4 Packing group II
 14.5 Environmental hazards No
 14.6 Special precautions for user
 Special Provisions None
 EmS-No F-E, S-D
 14.7 Maritime transport in bulk according to IMO instruments No information available

RID

14.1 UN number or ID number UN1166

14.2 UN proper shipping name DIOXOLANE
 14.3 Transport hazard class(es) 3
 14.4 Packing group II
 14.5 Environmental hazards No
 14.6 Special precautions for user
 Special Provisions None
 Classification code F1

ADR

14.1 UN number or ID number UN1166
 14.2 UN proper shipping name DIOXOLANE
 14.3 Transport hazard class(es) 3
 14.4 Packing group II
 14.5 Environmental hazards No
 14.6 Special precautions for user
 Special Provisions None
 Classification code F1
 Tunnel restriction code (D/E)

SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****National regulations****Authorisations and/or restrictions on use:**

This product contains one or more substances subject to restriction (UK REACH - Annex XVII).

This product does not contain substances subject to authorisation (UK REACH - Annex XIV).

Chemical name	Restricted substance per REACH Annex XVII	Substance subject to authorisation per REACH Annex XIV
METHANOL - 67-56-1	69, 75.	-

Persistent Organic Pollutants

Not applicable

Export Notification requirements

Not applicable

Dangerous substance category per COMAH Regulations 2015 (as amended)

P5c - FLAMMABLE LIQUIDS

Named dangerous substances per COMAH Regulations 2015 (as amended)**The Ozone-Depleting Substances Regulations 2015**

Not applicable

The Biocidal Products Regulations 2001 (as amended)

Not applicable

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended)

Not applicable

Poisons Act 1972 (Explosive Precursors) Regulations (as Amended)

Not applicable

International Inventories**TSCA**

Contact supplier for inventory compliance status

DSL/NDSL	Contact supplier for inventory compliance status
EINECS/ELINCS	Contact supplier for inventory compliance status
ENCS	Contact supplier for inventory compliance status
IECSC	Contact supplier for inventory compliance status
KECI	Contact supplier for inventory compliance status
PICCS	Contact supplier for inventory compliance status
AIIIC	Contact supplier for inventory compliance status
NZIoC	Contact supplier for inventory compliance status

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AIIIC - Australian Inventory of Industrial Chemicals
NZIoC - New Zealand Inventory of Chemicals

15.2. Chemical safety assessment**Chemical Safety Report**

A Chemical Safety Assessment has been carried out for this substance

SECTION 16: Other information**Key or legend to abbreviations and acronyms used in the safety data sheet****Full text of H-Statements referred to under section 3**

H225 - Highly flammable liquid and vapour
 H301 - Toxic if swallowed
 H311 - Toxic in contact with skin
 H318 - Causes serious eye damage
 H331 - Toxic if inhaled
 H360FD - May damage fertility. May damage the unborn child
 H370 - Causes damage to organs

Legend

SVHC: Substances of Very High Concern for Authorisation:

Legend Section 8: Exposure controls/personal protection

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation
+	Sensitisers		

Revision Note ***Indicates updated data since last publication

Classification procedure

Classification according to Regulation (EC) No. 1272/2008 [CLP]	Method Used
Acute oral toxicity	Calculation method
Acute dermal toxicity	Calculation method
Acute inhalation toxicity - gas	Calculation method
Acute inhalation toxicity - vapour	Calculation method
Acute inhalation toxicity - dust/mist	Calculation method
Skin corrosion/irritation	Calculation method
Serious eye damage/eye irritation	Calculation method
Respiratory sensitisation	Calculation method
Skin sensitisation	Calculation method
Mutagenicity	Calculation method
Carcinogenicity	Calculation method

STOT - single exposure
STOT - repeated exposure
Acute aquatic toxicity
Chronic aquatic toxicity
Aspiration hazard
Ozone

Calculation method
Calculation method
Calculation method
Calculation method
Calculation method
Calculation method

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
European Chemicals Agency (ECHA) Committee for Risk Assessment (ECHA_RAC)
European Chemicals Agency (ECHA) (ECHA_API)
Environmental Protection Agency
Acute Exposure Guideline Level(s) (AEGl(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
National Institute of Technology and Evaluation (NITE)
Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine's PubMed database (NLM PUBMED)
U.S. National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organisation for Economic Co-operation and Development Environment, Health, and Safety Publications
Organisation for Economic Co-operation and Development High Production Volume Chemicals Programme
Organisation for Economic Co-operation and Development Screening Information Data Set
World Health Organization

Prepared By Jitendra Panchal

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This material safety data sheet complies with the requirements of UK REACH Regulations (SI 2019/758 as amended)
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Manufacture of substance
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC1 - Manufacture of substances
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15 - Use as laboratory reagent
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC1 - Manufacture of substances

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at STP
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%

Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm2
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm2
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm2
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable respiratory protection.

Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Exposure duration	Avoid carrying out operation for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC1 - Manufacture of substances

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.0009147 mg/l	0.01
Marine water	0.000105 mg/l	0.01
Freshwater sediment	0.004 mg/kg dwt	0.01
Marine sediment	0.0004142 mg/kg dwt	0.01
STP: Sewage Treatment Plant	0 mg/l	0.01
Soil	0.00005005 mg/kg dwt	0.001

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.031 mg/m ³	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.02
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.334
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.74
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.414 mg/kg bw/day	0.095
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.607
PROC4 - Use in batch and other	Worker - dermal, long-term -	1.372 mg/kg bw/day	0.315

process (synthesis) where opportunity for exposure arises	systemic		
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.341
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.656
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.334
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.74
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.126
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	4.63 mg/m ³	0.256
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.382
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.204 mg/kg bw/day	0.047
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.559

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 1,3-Dioxolane
Pure substance/mixture Substance
REACH registration number 01-2119490744-29
CAS No 646-06-0
EC No (EU Index No) 211-463-5
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Formulation & (re)packing of substances and mixtures
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC2 - Formulation of preparations (mixtures)
Specific Environmental Release Category ESVOC SpERC 2.2.v1
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
 PROC15 - Use as laboratory reagent
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys)

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)
Specific Environmental Release Category - ESVOC SpERC 2.2.v1

Covers concentrations up to 100%
Product characteristics

Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa

Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%

Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm2
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Vapour pressure	101 hPa
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Vapour pressure	101 hPa
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Efficiency of at least 70% Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm2

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Vapour pressure	101 hPa
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training
Organisational measures to prevent	Assumes a good basic standard of occupational hygiene is implemented

/limit releases, dispersion and exposure	
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Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Vapour pressure	101 hPa
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Vapour pressure	101 hPa
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²

Process category(ies)	PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Vapour pressure	101 hPa
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Efficiency of at least 70% Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%

Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²

Section 3 - Exposure estimation

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)
Specific Environmental Release Category - ESVOC SpERC 2.2.v1

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.099 mg/l	0.01
Marine water	0.01 mg/l	0.01
Freshwater sediment	0.391 mg/kg dwt	0.01
Marine sediment	0.039 mg/kg dwt	0.01
STP: Sewage Treatment Plant	0.981 mg/l	0.981
Soil	0.002 mg/kg dwt	0.001

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.031 mg/m ³	< 0.01

PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.02
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.334
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.74
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.414 mg/kg bw/day	0.095
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.607
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.189
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	12.96 mg/m ³	0.717
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.906
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.189
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	13.89 mg/m ³	0.768
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.957
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.189
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	13.89 mg/m ³	0.768
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.957
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.189
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	9.723 mg/m ³	0.537
PROC8b - Transfer of substance or	Worker - combined, long-term		0.726

preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	- systemic		
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.189
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	11.11 mg/m ³	0.614
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.803
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - dermal, long-term - systemic	0.412 mg/kg bw/day	0.094
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - systemic	13.89 mg/m ³	0.768
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - combined, long-term - systemic		0.862
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.204 mg/kg bw/day	0.047
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.559

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Formulation & (re)packing of substances and mixtures
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC3 - Formulation in materials
Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC6 - Calendaring operations PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC3 - Formulation in materials

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa

Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm2

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm2

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm2

Process category(ies)	PROC6 - Calendaring operations
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%

Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented

Process category(ies)	PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²

Section 3 - Exposure estimation

Environmental release category(ies) - ERC3 - Formulation in materials

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.099 mg/l	0.01
Marine water	0.01 mg/l	0.01
Freshwater sediment	0.391 mg/kg dwt	0.01
Marine sediment	0.039 mg/kg dwt	0.01
STP: Sewage Treatment Plant	0.981 mg/l	0.981
Soil	0.008 mg/kg dwt	0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d

Consumer - inhalative, long-term - systemic

3.2 mg/m³

Calculation method	Used CHESAR model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	0.032
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.171
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.203
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.315
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.341
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.656
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.314
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.741
PROC6 - Calendaring operations	Worker - dermal, long-term - systemic	2.743 mg/kg bw/day	0.629
PROC6 - Calendaring operations	Worker - inhalative, long-term - systemic	3.858 mg/m ³	0.213
PROC6 - Calendaring operations	Worker - combined, long-term - systemic		0.842
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - dermal, long-term - systemic	3.43 mg/kg bw/day	0.787
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - systemic	3.858 mg/m ³	0.213
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - combined, long-term - systemic		1

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 1,3-Dioxolane
Pure substance/mixture Substance
REACH registration number 01-2119490744-29
CAS No 646-06-0
EC No (EU Index No) 211-463-5
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Industrial use resulting in manufacture of another substance (use of intermediates)
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC15 - Use as laboratory reagent

Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s

Further information

Operational conditions	Indoor use
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%

Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)

Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC15 - Use as laboratory reagent
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Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model
Remarks Qualitative approach used to conclude safe use

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.031 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.02

PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.314
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.741
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.414 mg/kg bw/day	0.095
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.607
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.189
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	12.96 mg/m ³	0.717
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.906
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.548 mg/kg bw/day	0.126
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	10.8 mg/m ³	0.597
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.723
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.189
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	13.89 mg/m ³	0.768
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.957
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.204 mg/kg bw/day	0.047
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.559

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 1,3-Dioxolane
Pure substance/mixture Substance
REACH registration number 01-2119490744-29
CAS No 646-06-0
EC No (EU Index No) 211-463-5
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Coatings
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
 PROC7 - Industrial spraying
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC10 - Roller application or brushing
 PROC12 - Use of blow agents in manufacture of foam
 PROC13 - Treatment of articles by dipping and pouring
 PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising

Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Covers concentrations up to 100%
Product characteristics

Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s

Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Emission days	220 d/y
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan

the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	1500 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa

Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%

Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC12 - Use of blow agents in manufacture of foam
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90% Limit the substance in product to 10 %
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.00215 mg/l	0.01
Marine water	0.000205 mg/l	0.01
Freshwater sediment	0.00847 mg/kg dwt	0.01
Marine sediment	0.000808 mg/kg dwt	0.01
STP: Sewage Treatment Plant	0 mg/l	0
Soil	0.094 mg/kg dwt	0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.314
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.741
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	0.032
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	15.43 mg/m ³	0.853
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.885
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.315
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.171
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.486
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.314
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.741
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	2.143 mg/kg bw/day	0.492
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.919
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.314
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.741
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.629

PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	2.315 mg/m ³	0.128
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.757
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.315
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.341
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.656
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.315
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.742
PROC12 - Use of blow agents in manufacture of foam	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.314
PROC12 - Use of blow agents in manufacture of foam	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC12 - Use of blow agents in manufacture of foam	Worker - combined, long-term - systemic		0.741
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.314
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.741
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.157
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - combined, long-term - systemic		0.584

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 1,3-Dioxolane
Pure substance/mixture Substance
REACH registration number 01-2119490744-29
CAS No 646-06-0
EC No (EU Index No) 211-463-5
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Coatings
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Specific Environmental Release Category ESVOC SpERC 4.3a.v1
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
 PROC7 - Industrial spraying
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC10 - Roller application or brushing
 PROC13 - Treatment of articles by dipping and pouring
 PROC15 - Use as laboratory reagent

Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SpERC 4.3a.v1

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s

Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%

Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with specific activity

health evaluation	training Efficiency of at least 95% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 95% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan

the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SpERC 4.3a.v1

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.1 mg/l	0.01
Marine water	0.01 mg/l	0.01
Freshwater sediment	0.396 mg/kg dwt	0.01
Marine sediment	0.04 mg/kg dwt	0.01
STP: Sewage Treatment Plant	0.981 mg/l	0.981
Soil	0.00835 mg/kg dwt	0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.031 mg/m ³	< 0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		< 0.02
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.314
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.741
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	0.032
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	15.43 mg/m ³	0.853
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.885
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.315
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.171
PROC4 - Use in batch and other	Worker - combined, long-term		0.486

process (synthesis) where opportunity for exposure arises	- systemic		
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.314
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.741
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	2.143 mg/kg bw/day	0.492
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	5.402 mg/m ³	0.299
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.791
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.314
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.741
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.315
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.742
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.315
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.742
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.314
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.741
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.34 mg/kg bw/day	0.078
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	15.43 mg/m ³	0.853

PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.931
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Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 1,3-Dioxolane
Pure substance/mixture Substance
REACH registration number 01-2119490744-29
CAS No 646-06-0
EC No (EU Index No) 211-463-5
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Coatings
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC10 - Roller application or brushing
 PROC11 - Non industrial spraying
 PROC13 - Treatment of articles by dipping and pouring
 PROC15 - Use as laboratory reagent

Sector(s) of use SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s

Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least

health evaluation	90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm2
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm2/s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm2
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm2/s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm2
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm2/s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid

Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	1500 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Use with local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.028 mg/l	0.01
Marine water	0.00277 mg/l	< 0.01
Freshwater sediment	0.11 mg/kg dwt	< 0.01
Marine sediment	0.011 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.256 mg/l	0.256
Soil	0.000422 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no	Worker - dermal, long-term -	0.034 mg/kg bw/day	< 0.01

likelihood of exposure	systemic		
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.309 mg/m ³	0.017
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.027
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.314
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.171
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.485
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/day	0.158
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.341
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.499
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.189
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.701
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.377
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.889
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.377
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.889
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.314
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427

dedicated facilities			
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.741
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.189
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.701
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.646 mg/kg bw/day	0.378
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.89
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	2.143 mg/kg bw/day	0.492
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.341
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.833
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.377
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.889
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.34 mg/kg bw/day	0.078
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.171
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.249

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 1,3-Dioxolane
Pure substance/mixture Substance
REACH registration number 01-2119490744-29
CAS No 646-06-0
EC No (EU Index No) 211-463-5
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Coatings
Type Consumer
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC8d - Wide dispersive outdoor use of processing aids in open systems
Product category(ies) PC1 - Adhesives, sealants PC9a - Coatings and paints, thinners, paint removers PC15 - Non-metal-surface treatment products PC23 - Leather tanning, dye, finishing, impregnation and care products PC24 - Lubricants, greases, release products

Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s

Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of consumer exposure

Product categories [PC]	PC1 - Adhesives, sealants
Product (sub) category(ies)	Glues, hobby use
Covers concentrations up to	55%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 2.16 g/event
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC1 - Adhesives, sealants
Product (sub) category(ies)	Glues DIY-use (carpet glue, tile glue, wood parquet glue)
Covers concentrations up to	15%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 1440 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC1 - Adhesives, sealants
Product (sub) category(ies)	Glue from spray
Covers concentrations up to	50%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 76.55 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC1 - Adhesives, sealants
Product (sub) category(ies)	Sealant
Covers concentrations up to	13%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 26.1 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC9a - Coatings and paints, thinners, paint removers
Product (sub) category(ies)	Waterborne latex wall paint
Covers concentrations up to	9%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 792 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC9a - Coatings and paints, thinners, paint removers
Product (sub) category(ies)	Solvent rich, high solid, water borne paint
Covers concentrations up to	30%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 144 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC9a - Coatings and paints, thinners, paint removers
Product (sub) category(ies)	Removers (paint-, glue-, wall paper-, sealant-remover)
Covers concentrations up to	75%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s

Amounts used	Amount per use 34.5 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC9a - Coatings and paints, thinners, paint removers
Product (sub) category(ies)	Aerosol spray can
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 142 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Use in room with a volume of minimum	34 m ³
Operational conditions	Covers use under typical household ventilation.

Product categories [PC]	PC15 - Non-metal-surface treatment products
Product (sub) category(ies)	Waterborne latex wall paint
Covers concentrations up to	9%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 792 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC15 - Non-metal-surface treatment products
Product (sub) category(ies)	Solvent rich, high solid, water borne paint
Covers concentrations up to	30%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 144 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC15 - Non-metal-surface treatment products
Product (sub) category(ies)	Aerosol spray can
Covers concentrations up to	50%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 142 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC15 - Non-metal-surface treatment products
Product (sub) category(ies)	Removers (paint-, glue-, wall paper-, sealant-remover)
Covers concentrations up to	5%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 34.5 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC23 - Leather tanning, dye, finishing, impregnation and care products
Product (sub) category(ies)	Polishes, wax / cream (floor, furniture, shoes)
Covers concentrations up to	1%

Physical form of product	Liquid
Amounts used	Amount per use 19 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC23 - Leather tanning, dye, finishing, impregnation and care products
Product (sub) category(ies)	Polishes, spray (furniture, shoes)
Covers concentrations up to	10%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 210 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC24 - Lubricants, greases, release products
Product (sub) category(ies)	Liquids
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 260 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC24 - Lubricants, greases, release products
Product (sub) category(ies)	Pastes
Covers concentrations up to	20%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC24 - Lubricants, greases, release products
Product (sub) category(ies)	Sprays
Covers concentrations up to	50%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 260 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dw
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dw
Soil	2.62 mg/kg dw
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method

Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.018 mg/l	< 0.01
Marine water	0.00178 mg/l	< 0.01
Freshwater sediment	0.071 mg/kg dw	< 0.01
Marine sediment	0.00702 mg/kg dw	< 0.01
STP: Sewage Treatment Plant	0.157 mg/l	0.157
Soil	0.000274 mg/kg dw	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method

Used ECETOC TRA model Used Petrorisk model

Product category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PC1 - Adhesives, sealants	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC1 - Adhesives, sealants	Consumer - dermal, long-term - systemic	3.273 mg/kg bw/d	0.504
PC1 - Adhesives, sealants	Consumer - inhalative, long-term - systemic	2.143 mg/m ³	0.476
PC1 - Adhesives, sealants	Consumer - combined, long-term - systemic		< 0.99
PC1 - Adhesives, sealants	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC1 - Adhesives, sealants	Consumer - dermal, long-term - systemic	0.00893 mg/kg bw/d	< 0.01
PC1 - Adhesives, sealants	Consumer - inhalative, long-term - systemic	4.383 mg/m ³	0.974
PC1 - Adhesives, sealants	Consumer - combined, long-term - systemic		< 0.994
PC1 - Adhesives, sealants	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC1 - Adhesives, sealants	Consumer - dermal, long-term - systemic	0.119 mg/kg bw/d	0.018
PC1 - Adhesives, sealants	Consumer - inhalative, long-term - systemic	2.762 mg/m ³	0.614
PC1 - Adhesives, sealants	Consumer - combined, long-term - systemic		< 0.642
PC1 - Adhesives, sealants	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC1 - Adhesives, sealants	Consumer - dermal, long-term - systemic	0.774 mg/kg bw/d	0.119
PC1 - Adhesives, sealants	Consumer - inhalative, long-term - systemic	3.799 mg/m ³	0.844
PC1 - Adhesives, sealants	Consumer - combined, long-term - systemic		< 0.973
PC9a - Coatings and paints, thinners, paint removers	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC9a - Coatings and paints, thinners, paint removers	Consumer - dermal, long-term - systemic	0.257 mg/kg bw/d	0.04

PC9a - Coatings and paints, thinners, paint removers	Consumer - inhalative, long-term - systemic	4.208 mg/m ³	0.935
PC9a - Coatings and paints, thinners, paint removers	Consumer - combined, long-term - systemic		< 0.985
PC9a - Coatings and paints, thinners, paint removers	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC9a - Coatings and paints, thinners, paint removers	Consumer - dermal, long-term - systemic	1.715 mg/kg bw/d	0.264
PC9a - Coatings and paints, thinners, paint removers	Consumer - inhalative, long-term - systemic	3.117 mg/m ³	0.693
PC9a - Coatings and paints, thinners, paint removers	Consumer - combined, long-term - systemic		< 0.967
PC9a - Coatings and paints, thinners, paint removers	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC9a - Coatings and paints, thinners, paint removers	Consumer - dermal, long-term - systemic	4.288 mg/kg bw/d	0.66
PC9a - Coatings and paints, thinners, paint removers	Consumer - inhalative, long-term - systemic	1.461 mg/m ³	0.325
PC9a - Coatings and paints, thinners, paint removers	Consumer - combined, long-term - systemic		< 0.995
PC9a - Coatings and paints, thinners, paint removers	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC9a - Coatings and paints, thinners, paint removers	Consumer - dermal, long-term - systemic	0 mg/kg bw/d	< 0.01
PC9a - Coatings and paints, thinners, paint removers	Consumer - inhalative, long-term - systemic	4.286 mg/m ³	0.952
PC9a - Coatings and paints, thinners, paint removers	Consumer - combined, long-term - systemic		< 0.972
PC15 - Non-metal-surface treatment products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC15 - Non-metal-surface treatment products	Consumer - dermal, long-term - systemic	0.257 mg/kg bw/d	0.04
PC15 - Non-metal-surface treatment products	Consumer - inhalative, long-term - systemic	4.208 mg/m ³	0.935
PC15 - Non-metal-surface treatment products	Consumer - combined, long-term - systemic		< 0.985
PC15 - Non-metal-surface treatment products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC15 - Non-metal-surface treatment products	Consumer - dermal, long-term - systemic	0.858 mg/kg bw/d	0.132
PC15 - Non-metal-surface treatment products	Consumer - inhalative, long-term - systemic	3.117 mg/m ³	0.693
PC15 - Non-metal-surface treatment products	Consumer - combined, long-term - systemic		< 0.835
PC15 - Non-metal-surface treatment products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC15 - Non-metal-surface treatment products	Consumer - dermal, long-term - systemic	0 mg/kg bw/d	< 0.01
PC15 - Non-metal-surface treatment products	Consumer - inhalative, long-term - systemic	4.286 mg/m ³	0.952
PC15 - Non-metal-surface treatment products	Consumer - combined, long-term - systemic		< 0.972
PC15 - Non-metal-surface treatment products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC15 - Non-metal-surface treatment products	Consumer - dermal, long-term - systemic	4.002 mg/kg bw/d	0.616
PC15 - Non-metal-surface treatment products	Consumer - inhalative, long-term - systemic	1.364 mg/m ³	0.303

PC15 - Non-metal-surface treatment products	Consumer - combined, long-term - systemic		< 0.929
PC23 - Leather tanning, dye, finishing, impregnation and care products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC23 - Leather tanning, dye, finishing, impregnation and care products	Consumer - dermal, long-term - systemic	4.288 mg/kg bw/d	0.66
PC23 - Leather tanning, dye, finishing, impregnation and care products	Consumer - inhalative, long-term - systemic	1.364 mg/m ³	0.303
PC23 - Leather tanning, dye, finishing, impregnation and care products	Consumer - combined, long-term - systemic		< 0.973
PC23 - Leather tanning, dye, finishing, impregnation and care products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC23 - Leather tanning, dye, finishing, impregnation and care products	Consumer - dermal, long-term - systemic	1.429 mg/kg bw/d	0.22
PC23 - Leather tanning, dye, finishing, impregnation and care products	Consumer - inhalative, long-term - systemic	3.247 mg/m ³	0.722
PC23 - Leather tanning, dye, finishing, impregnation and care products	Consumer - combined, long-term - systemic		< 0.952
PC24 - Lubricants, greases, release products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC24 - Lubricants, greases, release products	Consumer - dermal, long-term - systemic	1.429 mg/kg bw/d	0.22
PC24 - Lubricants, greases, release products	Consumer - inhalative, long-term - systemic	3.247 mg/m ³	0.722
PC24 - Lubricants, greases, release products	Consumer - combined, long-term - systemic		< 0.952
PC24 - Lubricants, greases, release products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC24 - Lubricants, greases, release products	Consumer - dermal, long-term - systemic	1.715 mg/kg bw/d	0.264
PC24 - Lubricants, greases, release products	Consumer - inhalative, long-term - systemic	0 mg/m ³	< 0.01
PC24 - Lubricants, greases, release products	Consumer - combined, long-term - systemic		< 0.284
PC24 - Lubricants, greases, release products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC24 - Lubricants, greases, release products	Consumer - dermal, long-term - systemic	1.429 mg/kg bw/d	0.22
PC24 - Lubricants, greases, release products	Consumer - inhalative, long-term - systemic	3.247 mg/m ³	0.722
PC24 - Lubricants, greases, release products	Consumer - combined, long-term - systemic		< 0.952

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 1,3-Dioxolane
Pure substance/mixture Substance
REACH registration number 01-2119490744-29
CAS No 646-06-0
EC No (EU Index No) 211-463-5
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Cleaning agent
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Specific Environmental Release Category ESVOC SpERC 4.4a.v1
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC7 - Industrial spraying
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC10 - Roller application or brushing
 PROC13 - Treatment of articles by dipping and pouring
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SpERC 4.4a.v1

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s

Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure	
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)

Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm2
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm2/s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	1500 cm2
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm2/s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s

	Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable gloves tested to EN 374 Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SpERC 4.4a.v1

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.022 mg/l	< 0.01
Marine water	0.000217 mg/l	< 0.01
Freshwater sediment	0.086 mg/kg dwt	< 0.01
Marine sediment	0.00855 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.196 mg/l	0.196
Soil	0.019 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.314
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.741
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.414 mg/kg bw/day	0.095
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.607
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.857 mg/kg bw/day	0.197
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	4.63 mg/m ³	0.256

PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.453
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	0.857 mg/kg bw/day	0.197
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	4.63 mg/m ³	0.256
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.453
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.314
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.741
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.629
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	2.315 mg/m ³	0.128
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.757
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.256
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	4.63 mg/m ³	0.252
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.508
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.314
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.427
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.741

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 1,3-Dioxolane
Pure substance/mixture Substance
REACH registration number 01-2119490744-29
CAS No 646-06-0
EC No (EU Index No) 211-463-5
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Cleaning agent
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC10 - Roller application or brushing
 PROC11 - Non industrial spraying
 PROC13 - Treatment of articles by dipping and pouring

Sector(s) of use SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s

Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure	
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C
Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	240 cm ²
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C
Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent	Assumes a good basic standard of occupational hygiene is implemented

/limit releases, dispersion and exposure	
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan

the worker	
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	1500 cm ²
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Covers skin contact area up to	480 cm ²
Indoor/Outdoor use	Indoor use
Assumes process temperature up to	40°C

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.00377 mg/l	< 0.01
Marine water	0.000367 mg/l	< 0.01
Freshwater sediment	0.015 mg/kg dwt	< 0.01
Marine sediment	0.00145 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.016 mg/l	0.016
Soil	0.0000644 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.314
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	4.63 mg/m ³	0.256
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.57
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	0.032
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.341
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.373
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.315
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	10.8 mg/m ³	0.597
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.912

PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.377
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.889
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.377
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.889
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	0.549 mg/kg bw/day	0.126
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	15.43 mg/m ³	0.853
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.979
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	1.071 mg/kg bw/day	0.246
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.758
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.377
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.512
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.889

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Cleaning agent
Type	Consumer
Main user group	Consumer uses: Private households (= general public = consumers)
Environmental release category(ies)	ERC8d - Wide dispersive outdoor use of processing aids in open systems
Product category(ies)	PC9a - Coatings and paints, thinners, paint removers PC24 - Lubricants, greases, release products PC35 - Washing and cleaning products (including solvent based products)
Sector(s) of use	SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Covers concentrations up to 100%
Product characteristics

Physical form of product	Liquid
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of consumer exposure

Product categories [PC]	PC9a - Coatings and paints, thinners, paint removers
Product (sub) category(ies)	Waterborne latex wall paint
Covers concentrations up to	1.5%
Physical form of product	Liquid
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Covers skin contact area up to	428 cm ²
Use in room with a volume of minimum	20 m ³
Operational conditions	Covers use under typical household ventilation.

Product categories [PC]	PC9a - Coatings and paints, thinners, paint removers
Product (sub) category(ies)	Solvent rich, high solid, water borne paint
Covers concentrations up to	3%
Physical form of product	Liquid

Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Covers skin contact area up to	428 cm ²
Use in room with a volume of minimum	20 m ³
Operational conditions	Covers use under typical household ventilation.

Product categories [PC]	PC9a - Coatings and paints, thinners, paint removers
Product (sub) category(ies)	Aerosol spray can
Covers concentrations up to	70%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 15 minutes
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Use in room with a volume of minimum	34 m ³
Operational conditions	Covers use under typical household ventilation.

Product categories [PC]	PC9a - Coatings and paints, thinners, paint removers
Product (sub) category(ies)	Removers (paint-, glue-, wall paper-, sealant-remover)
Covers concentrations up to	70%
Physical form of product	Liquid
Exposure duration	Avoid carrying out operation for more than 2 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Use in room with a volume of minimum	20 m ³
Operational conditions	Covers use under typical household ventilation.

Product categories [PC]	PC24 - Lubricants, greases, release products
Product (sub) category(ies)	Liquids
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Covers skin contact area up to	428 cm ²
Use in room with a volume of minimum	34 m ³
Operational conditions	Covers use under typical household ventilation.

Product categories [PC]	PC24 - Lubricants, greases, release products
Product (sub) category(ies)	Pastes
Covers concentrations up to	20%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Covers skin contact area up to	428 cm ²

Product categories [PC]	PC24 - Lubricants, greases, release products
Product (sub) category(ies)	Sprays
Covers concentrations up to	50%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Covers skin contact area up to	428 cm ²
Use in room with a volume of minimum	20 m ³
Operational conditions	Covers use under typical household ventilation.

Product categories [PC]	PC35 - Washing and cleaning products (including solvent based products)
Product (sub) category(ies)	Laundry and dish washing products
Covers concentrations up to	5%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 14.4 g/event

Exposure duration	Avoid carrying out operation for more than 0.5 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC35 - Washing and cleaning products (including solvent based products)
Product (sub) category(ies)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)
Covers concentrations up to	0.19%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 16.8 g/event
Exposure duration	Avoid carrying out operation for more than 0.33 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC35 - Washing and cleaning products (including solvent based products)
Product (sub) category(ies)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)
Covers concentrations up to	0.35%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 16.8 g/event
Exposure duration	Avoid carrying out operation for more than 0.33 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method	Used CHESAR model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.003 mg/l	< 0.01
Marine water	0.0002669 mg/l	< 0.01
Freshwater sediment	0.01 mg/kg dwt	< 0.01
Marine sediment	0.001 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.016 mg/l	0.016
Soil	0.00007414 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method

ESIG
Used ECETOC TRA model

Product category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PC9a - Coatings and paints, thinners, paint removers	Consumer - oral, long-term - systemic	0 mg/kg bw/d	0
PC9a - Coatings and paints, thinners, paint removers	Consumer - dermal, long-term - systemic	0.01 mg/kg bw/d	0.012
PC9a - Coatings and paints, thinners, paint removers	Consumer - inhalative, long-term - systemic	1.16 mg/m ³	0.204
PC9a - Coatings and paints, thinners, paint removers	Consumer - combined, long-term - systemic		0.216
PC9a - Coatings and paints, thinners, paint removers	Consumer - oral, long-term - systemic	0 mg/kg bw/d	0
PC9a - Coatings and paints, thinners, paint removers	Consumer - dermal, long-term - systemic	0.03 mg/kg bw/d	0.038
PC9a - Coatings and paints, thinners, paint removers	Consumer - inhalative, long-term - systemic	0.3 mg/m ³	0.053
PC9a - Coatings and paints, thinners, paint removers	Consumer - combined, long-term - systemic		0.091
PC9a - Coatings and paints, thinners, paint removers	Consumer - oral, long-term - systemic	0 mg/kg bw/d	0
PC9a - Coatings and paints, thinners, paint removers	Consumer - dermal, long-term - systemic	0 mg/kg bw/d	0
PC9a - Coatings and paints, thinners, paint removers	Consumer - inhalative, long-term - systemic	0.47 mg/m ³	0.08
PC9a - Coatings and paints, thinners, paint removers	Consumer - combined, long-term - systemic		0.08
PC9a - Coatings and paints, thinners, paint removers	Consumer - oral, long-term - systemic	0 mg/kg bw/d	0
PC9a - Coatings and paints, thinners, paint removers	Consumer - dermal, long-term - systemic	0.5 mg/kg bw/d	0.63
PC9a - Coatings and paints, thinners, paint removers	Consumer - inhalative, long-term - systemic	1.42 mg/m ³	0.25
PC9a - Coatings and paints, thinners, paint removers	Consumer - combined, long-term - systemic		0.88
PC24 - Lubricants, greases, release products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	0
PC24 - Lubricants, greases, release products	Consumer - dermal, long-term - systemic	0.74 mg/kg bw/d	0.925
PC24 - Lubricants, greases, release products	Consumer - inhalative, long-term - systemic	0.04 mg/m ³	0.01
PC24 - Lubricants, greases, release products	Consumer - combined, long-term - systemic		0.935
PC24 - Lubricants, greases, release products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	0
PC24 - Lubricants, greases, release products	Consumer - dermal, long-term - systemic	0.37 mg/kg bw/d	0.462
PC24 - Lubricants, greases, release products	Consumer - inhalative, long-term - systemic	0 mg/m ³	0
PC24 - Lubricants, greases, release products	Consumer - combined, long-term - systemic		0.462
PC24 - Lubricants, greases, release products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	0
PC24 - Lubricants, greases, release products	Consumer - dermal, long-term - systemic	0.51 mg/kg bw/d	0.638

PC24 - Lubricants, greases, release products	Consumer - inhalative, long-term - systemic	0.2 mg/m ³	0.035
PC24 - Lubricants, greases, release products	Consumer - combined, long-term - systemic		0.673
PC35 - Washing and cleaning products (including solvent based products)	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC35 - Washing and cleaning products (including solvent based products)	Consumer - dermal, long-term - systemic	5.717 mg/kg bw/d	0.88
PC35 - Washing and cleaning products (including solvent based products)	Consumer - inhalative, long-term - systemic	0.52 mg/m ³	0.115
PC35 - Washing and cleaning products (including solvent based products)	Consumer - combined, long-term - systemic		< 1.005
PC35 - Washing and cleaning products (including solvent based products)	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC35 - Washing and cleaning products (including solvent based products)	Consumer - dermal, long-term - systemic	5.717 mg/kg bw/d	0.88
PC35 - Washing and cleaning products (including solvent based products)	Consumer - inhalative, long-term - systemic	0.52 mg/m ³	0.115
PC35 - Washing and cleaning products (including solvent based products)	Consumer - combined, long-term - systemic		< 1.005
PC35 - Washing and cleaning products (including solvent based products)	Consumer - oral, long-term - systemic	0 mg/kg bw/d	0
PC35 - Washing and cleaning products (including solvent based products)	Consumer - dermal, long-term - systemic	5.717 mg/kg bw/d	0.88
PC35 - Washing and cleaning products (including solvent based products)	Consumer - inhalative, long-term - systemic	0.52 mg/m ³	0.115
PC35 - Washing and cleaning products (including solvent based products)	Consumer - combined, long-term - systemic		0.995

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Lubricants
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC7 - Industrial use of substances in closed systems
Specific Environmental Release Category	ESVOC SpERC 4.6a.v1
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC7 - Industrial spraying PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities 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 PROC17 - Lubrication at high energy conditions and in partly open process PROC18 - Greasing at high energy conditions
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC7 - Industrial use of substances in closed systems
Specific Environmental Release Category - ESVOC SpERC 4.6a.v1

Covers concentrations up to 100%
Product characteristics

Physical form of product	Liquid
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented

Indoor/Outdoor use	Indoor use
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Provide a good standard of general ventilation. Natural ventilation is from doors, windows

control dispersion from source towards the worker	etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC18 - Greasing at high energy conditions
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC7 - Industrial use of substances in closed systems

Specific Environmental Release Category - ESVOC SpERC 4.6a.v1

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method	Used CHESAR model	
Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.005 mg/l	< 0.01
Marine water	0.000473 mg/l	< 0.01
Freshwater sediment	0.018 mg/kg dwt	< 0.01
Marine sediment	0.002 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.037 mg/l	0.037
Soil	0.0001222 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method	Used CHESAR model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.031 mg/m ³	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.02
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.334
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.74
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/day	0.168
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	15.43 mg/m ³	0.812
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.98
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.167
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.162
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.329
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.334
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406

PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.74
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	2.143 mg/kg bw/day	0.523
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.929
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.067
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.473
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.411 mg/kg bw/day	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	13.89 mg/m ³	0.731
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.831
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.167
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.325
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.492
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.646 mg/kg bw/day	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	4.63 mg/m ³	0.244
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.645
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.334
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.74
PROC17 - Lubrication at high energy	Worker - dermal, long-term - systemic	2.743 mg/kg bw/day	0.669

conditions and in partly open process	systemic		
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.162
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.831
PROC18 - Greasing at high energy conditions	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.334
PROC18 - Greasing at high energy conditions	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.162
PROC18 - Greasing at high energy conditions	Worker - combined, long-term - systemic		0.496

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Lubricants
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10 - Roller application or brushing PROC11 - Non industrial spraying PROC13 - Treatment of articles by dipping and pouring PROC17 - Lubrication at high energy conditions and in partly open process PROC18 - Greasing at high energy conditions PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Provide a good standard of general ventilation. Natural ventilation is from doors, windows

control dispersion from source towards the worker	etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented

Indoor/Outdoor use	Indoor use
Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC18 - Greasing at high energy conditions
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt

Soil 2.62 mg/kg dwt
Impact on Sewage Treatment 1 mg/l
Intermittent release 0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.001 mg/l	< 0.01
Marine water	0.0001212 mg/l	< 0.01
Freshwater sediment	0.004 mg/kg dwt	< 0.01
Marine sediment	0.0004781 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.002 mg/l	0.037
Soil	0.00005246 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic 2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic 18.2 mg/m³
Consumer - oral, long-term - systemic 1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic 1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic 3.2 mg/m³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.309 mg/m ³	0.016
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.026
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.067
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.162
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.229
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/day	0.168
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.325
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.493
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.201
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.688
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.401

PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.888
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.669
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	3.858 mg/m ³	0.203
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.872
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.201
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.688
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.646 mg/kg bw/day	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.888
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	0.857 mg/kg bw/day	0.209
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	12.35 mg/m ³	0.65
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.859
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.401
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.888
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	0.549 mg/kg bw/day	0.134
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.325
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.459
PROC18 - Greasing at high energy conditions	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.067
PROC18 - Greasing at high energy	Worker - inhalative, long-term	6.173 mg/m ³	0.325

conditions	- systemic		
PROC18 - Greasing at high energy conditions	Worker - combined, long-term - systemic		0.392
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - dermal, long-term - systemic	0.068 mg/kg bw/day	0.017
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.325
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - combined, long-term - systemic		0.342

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 1,3-Dioxolane
Pure substance/mixture Substance
REACH registration number 01-2119490744-29
CAS No 646-06-0
EC No (EU Index No) 211-463-5
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Lubricants
Type Consumer
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC8d - Wide dispersive outdoor use of processing aids in open systems
Product category(ies) PC1 - Adhesives, sealants PC24 - Lubricants, greases, release products
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s

Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of consumer exposure

Product categories [PC]	PC1 - Adhesives, sealants
Product (sub) category(ies)	Glues, hobby use
Covers concentrations up to	55%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 2.16 g/event
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC] PC1 - Adhesives, sealants

Product (sub) category(ies)	Glues DIY-use (carpet glue, tile glue, wood parquet glue)
Covers concentrations up to	15%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 1440 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC1 - Adhesives, sealants
Product (sub) category(ies)	Glue from spray
Covers concentrations up to	50%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 76.55 g/event
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC1 - Adhesives, sealants
Product (sub) category(ies)	Sealant
Covers concentrations up to	13%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 26.1 g/event
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC24 - Lubricants, greases, release products
Product (sub) category(ies)	Liquids
Covers concentrations up to	50%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 260 g/event
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC24 - Lubricants, greases, release products
Product (sub) category(ies)	Pastes
Covers concentrations up to	45%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Product categories [PC]	PC24 - Lubricants, greases, release products
Product (sub) category(ies)	Sprays
Covers concentrations up to	50%
Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s
Amounts used	Amount per use 260 g/event

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
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Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.00242 mg/l	< 0.01
Marine water	0.000232 mg/l	< 0.01
Freshwater sediment	0.009544 mg/kg dwt	< 0.01
Marine sediment	0.000915 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.0027 mg/l	0.157
Soil	0.0000443 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used ECETOC TRA model

Product category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PC1 - Adhesives, sealants	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC1 - Adhesives, sealants	Consumer - dermal, long-term - systemic	3.273 mg/kg bw/d	0.504
PC1 - Adhesives, sealants	Consumer - inhalative, long-term - systemic	2.143 mg/m ³	0.476
PC1 - Adhesives, sealants	Consumer - combined, long-term - systemic		< 0.99
PC1 - Adhesives, sealants	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC1 - Adhesives, sealants	Consumer - dermal, long-term - systemic	0 mg/kg bw/d	< 0.01
PC1 - Adhesives, sealants	Consumer - inhalative, long-term - systemic	4.383 mg/m ³	0.974
PC1 - Adhesives, sealants	Consumer - combined, long-term - systemic		< 0.994
PC1 - Adhesives, sealants	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC1 - Adhesives, sealants	Consumer - dermal, long-term - systemic	0.119 mg/kg bw/d	0.018

	- systemic		
PC1 - Adhesives, sealants	Consumer - inhalative, long-term - systemic	2.762 mg/m ³	0.614
PC1 - Adhesives, sealants	Consumer - combined, long-term - systemic		< 0.642
PC1 - Adhesives, sealants	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC1 - Adhesives, sealants	Consumer - dermal, long-term - systemic	0.774 mg/kg bw/d	0.119
PC1 - Adhesives, sealants	Consumer - inhalative, long-term - systemic	3.799 mg/m ³	0.844
PC1 - Adhesives, sealants	Consumer - combined, long-term - systemic		< 0.973
PC24 - Lubricants, greases, release products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC24 - Lubricants, greases, release products	Consumer - dermal, long-term - systemic	1.429 mg/kg bw/d	0.22
PC24 - Lubricants, greases, release products	Consumer - inhalative, long-term - systemic	3.247 mg/m ³	0.722
PC24 - Lubricants, greases, release products	Consumer - combined, long-term - systemic		< 0.952
PC24 - Lubricants, greases, release products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC24 - Lubricants, greases, release products	Consumer - dermal, long-term - systemic	6.432 mg/kg bw/d	0.99
PC24 - Lubricants, greases, release products	Consumer - inhalative, long-term - systemic	0 mg/m ³	< 0.01
PC24 - Lubricants, greases, release products	Consumer - combined, long-term - systemic		0.99
PC24 - Lubricants, greases, release products	Consumer - oral, long-term - systemic	0 mg/kg bw/d	< 0.01
PC24 - Lubricants, greases, release products	Consumer - dermal, long-term - systemic	1.429 mg/kg bw/d	0.22
PC24 - Lubricants, greases, release products	Consumer - inhalative, long-term - systemic	3.247 mg/m ³	0.722
PC24 - Lubricants, greases, release products	Consumer - combined, long-term - systemic		< 0.952

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Metal working fluids
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Specific Environmental Release Category	ESVOC SpERC 4.7a.v1
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC7 - Industrial spraying PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities 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 PROC17 - Lubrication at high energy conditions and in partly open process
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SpERC 4.7a.v1

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent	Assumes a good basic standard of occupational hygiene is implemented

/limit releases, dispersion and exposure	
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Provide a good standard of general ventilation. Natural ventilation is from doors, windows

control dispersion from source towards the worker	etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SpERC 4.7a.v1

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method

Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.013 mg/l	< 0.01
Marine water	0.001 mg/l	< 0.01
Freshwater sediment	0.052 mg/kg dwt	< 0.01
Marine sediment	0.005 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.123 mg/l	0.123
Soil	0.001 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method

Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.031 mg/m ³	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.02
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.334

PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.74
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/day	0.168
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	15.43 mg/m ³	0.812
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.98
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.334
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.74
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	2.143 mg/kg bw/day	0.523
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.929
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.067
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.473
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.411 mg/kg bw/day	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	13.89 mg/m ³	0.731
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.831
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.167
PROC9 - Transfer of substance or	Worker - inhalative, long-term	6.173 mg/m ³	0.325

preparation into small containers (dedicated filling line, including weighing)	- systemic		
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.492
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.646 mg/kg bw/day	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	4.63 mg/m ³	0.244
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.645
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.334
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.74
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	2.743 mg/kg bw/day	0.669
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.162
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.831

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Metal working fluids
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10 - Roller application or brushing PROC11 - Non industrial spraying PROC13 - Treatment of articles by dipping and pouring PROC17 - Lubrication at high energy conditions and in partly open process
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to	Use suitable eye protection

personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented

Indoor/Outdoor use	Indoor use
Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC17 - Lubrication at high energy conditions and in partly open process
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

**Predicted No Effect Concentration
(PNEC)**

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.001 mg/l	< 0.01
Marine water	0.0001185 mg/l	< 0.01
Freshwater sediment	0.004 mg/kg dwt	< 0.01
Marine sediment	0.0004675 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.001 mg/l	0.01
Soil	0.00005206 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.309 mg/m ³	0.016
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.026
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.067
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.162
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.229
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	0.034
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.325
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.359
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	0.329 mg/kg bw/day	0.08
PROC5 - Mixing or blending in batch processes for formulation of	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487

preparations and articles (multi-stage and/or significant contact)			
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.567
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.888
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.669
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	3.858 mg/m ³	0.203
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.872
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.646 mg/kg bw/day	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.888
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	0.857 mg/kg bw/day	0.209
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	12.35 mg/m ³	0.65
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.859
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.401
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.888
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - dermal, long-term - systemic	0.549 mg/kg bw/day	0.134
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.325
PROC17 - Lubrication at high energy conditions and in partly open process	Worker - combined, long-term - systemic		0.459

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Blowing agent
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Specific Environmental Release Category	ESVOC SpERC 4.10a.v1
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC6 - Calendaring operations PROC7 - Industrial spraying PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SpERC 4.10a.v1

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%

Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC6 - Calendaring operations
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out operation for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%

Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A/P2 filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A/P2 filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A/P2 filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SpERC 4.10a.v1

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.001 mg/l	< 0.01
Marine water	0.0001442 mg/l	< 0.01
Freshwater sediment	0.005 mg/kg dwt	< 0.01
Marine sediment	0.0005691 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.004 mg/l	< 0.01
Soil	0.002 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.031 mg/m ³	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.02
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.334
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.74
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/day	0.168
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	15.43 mg/m ³	0.812
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.98
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.167
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.162
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.329

PROC6 - Calendaring operations	Worker - dermal, long-term - systemic	1.646 mg/kg bw/day	0.401
PROC6 - Calendaring operations	Worker - inhalative, long-term - systemic	4.63 mg/m ³	0.244
PROC6 - Calendaring operations	Worker - combined, long-term - systemic		0.645
PROC7 - Industrial spraying	Worker - dermal, long-term - systemic	2.143 mg/kg bw/day	0.523
PROC7 - Industrial spraying	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC7 - Industrial spraying	Worker - combined, long-term - systemic		0.929
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.411 mg/kg bw/day	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	13.89 mg/m ³	0.731
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.831
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.646 mg/kg bw/day	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	4.63 mg/m ³	0.244
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.645
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.334
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.74
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - dermal, long-term - systemic	0.343 mg/kg bw/day	0.084
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - combined, long-term - systemic		0.49

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Blowing agent
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC6 - Calendaring operations PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10 - Roller application or brushing PROC11 - Non industrial spraying PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure	
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%

health evaluation	90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC6 - Calendaring operations
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out operation for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid

Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.0009686 mg/l	< 0.01
Marine water	0.0001104 mg/l	< 0.01
Freshwater sediment	0.004 mg/kg dwt	< 0.01
Marine sediment	0.0004355 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.00005397 mg/l	< 0.01
Soil	0.00005085 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.309 mg/m ³	0.016
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.026
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.067
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.162
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.229
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg bw/day	0.034
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.325
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.359
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.201
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487

PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.688
PROC6 - Calendaring operations	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.268
PROC6 - Calendaring operations	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.325
PROC6 - Calendaring operations	Worker - combined, long-term - systemic		0.593
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.888
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.669
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	3.858 mg/m ³	0.203
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.872
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.646 mg/kg bw/day	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.888
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	0.857 mg/kg bw/day	0.209
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.325
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.534
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - dermal, long-term - systemic	0.082 mg/kg bw/day	0.02
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - systemic	18.52 mg/m ³	0.975
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - combined, long-term - systemic		0.995

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Anti-freeze and de-icing products
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC11 - Non industrial spraying
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid

Exposure duration	Avoid carrying out operation for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%

Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dw
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dw
Soil	2.62 mg/kg dw
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.001 mg/l	< 0.01
Marine water	0.0001266 mg/l	< 0.01
Freshwater sediment	0.004 mg/kg dw	< 0.01
Marine sediment	0.0004994 mg/kg dw	< 0.01
STP: Sewage Treatment Plant	0.002 mg/l	< 0.01
Soil	0.00005326 mg/kg dw	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method	Used CHESAR model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.001 mg/kg bw/day	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.009 mg/m ³	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.02
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.067
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.162
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.229
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.888
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.669
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	3.858 mg/m ³	0.203
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.872
PROC11 - Non industrial spraying	Worker - dermal, long-term - systemic	0.857 mg/kg bw/day	0.209
PROC11 - Non industrial spraying	Worker - inhalative, long-term - systemic	12.35 mg/m ³	0.65
PROC11 - Non industrial spraying	Worker - combined, long-term - systemic		0.859

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use as laboratory reagent
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	PROC10 - Roller application or brushing PROC15 - Use as laboratory reagent
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Covers concentrations up to 100%
Product characteristics

Physical form of product	Liquid
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to	Provide a good standard of general ventilation. Natural ventilation is from doors, windows

control dispersion from source towards the worker	etc. Controlled ventilation means air is supplied or removed by a powered fan Use high-performance fume cupboard
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Use high-performance fume cupboard
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.099 mg/l	< 0.01
Marine water	0.01 mg/l	< 0.01
Freshwater sediment	0.391 mg/kg dwt	< 0.01
Marine sediment	0.039 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.981 mg/l	0.981
Soil	0.002 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³

Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method	Used CHESAR model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.646 mg/kg bw/day	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	4.63 mg/m ³	0.244
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.645
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.34 mg/kg bw/day	0.083
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	15.43 mg/m ³	0.812
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.895

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 1,3-Dioxolane
Pure substance/mixture Substance
REACH registration number 01-2119490744-29
CAS No 646-06-0
EC No (EU Index No) 211-463-5
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Use as laboratory reagent
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems
Process category(ies) PROC10 - Roller application or brushing
 PROC15 - Use as laboratory reagent
Sector(s) of use SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan

the worker	Use high-performance fume cupboard
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Use high-performance fume cupboard
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.002 mg/l	< 0.01
Marine water	0.0001724 mg/l	< 0.01
Freshwater sediment	0.006 mg/kg dwt	< 0.01
Marine sediment	0.0006805 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.007 mg/l	0.981
Soil	0.00006009 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³

Consumer - oral, long-term - systemic 1.31 mg/kg bw/d
 Consumer - dermal, long-term - systemic 1.31 mg/kg bw/d
 Consumer - inhalative, long-term - systemic 3.2 mg/m³

Calculation method	Used CHESAR model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC10 - Roller application or brushing	Worker - dermal, long-term - systemic	1.646 mg/kg bw/day	0.401
PROC10 - Roller application or brushing	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC10 - Roller application or brushing	Worker - combined, long-term - systemic		0.888
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.041 mg/kg bw/day	0.01
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	18.52 mg/m ³	0.975
PROC15 - Use as laboratory reagent	Worker - combined, long-term - systemic		0.985

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in polymer processing.
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Specific Environmental Release Category	ESVOC SpERC 4.21a.v1
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC6 - Calendaring operations PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13 - Treatment of articles by dipping and pouring PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys)

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SpERC 4.21a.v1

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%

Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC6 - Calendaring operations
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out operation for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 80% Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%

Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a respirator conforming to EN 140 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SpERC 4.21a.v1

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.0009147 mg/l	< 0.01
Marine water	0.000105 mg/l	< 0.01
Freshwater sediment	0.004 mg/kg dwt	< 0.01
Marine sediment	0.0004142 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0 mg/l	0
Soil	0.047 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.031 mg/m ³	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.02
PROC2 - Use in closed, continuous process with occasional controlled	Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.334

exposure			
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.74
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.69 mg/kg bw/day	0.168
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	15.43 mg/m ³	0.812
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - combined, long-term - systemic		0.98
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.167
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.162
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - combined, long-term - systemic		0.329
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.334
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - combined, long-term - systemic		0.74
PROC6 - Calendaring operations	Worker - dermal, long-term - systemic	1.646 mg/kg bw/day	0.401
PROC6 - Calendaring operations	Worker - inhalative, long-term - systemic	4.63 mg/m ³	0.244
PROC6 - Calendaring operations	Worker - combined, long-term - systemic		0.645
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.067
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.473
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.411 mg/kg bw/day	0.1
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	13.89 mg/m ³	0.731

dedicated facilities			
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.831
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.167
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.325
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - combined, long-term - systemic		0.492
PROC13 - Treatment of articles by dipping and pouring	Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.334
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC13 - Treatment of articles by dipping and pouring	Worker - combined, long-term - systemic		0.74
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - dermal, long-term - systemic	0.343 mg/kg bw/day	0.084
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - systemic	7.717 mg/m ³	0.406
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - combined, long-term - systemic		0.49

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	1,3-Dioxolane
Pure substance/mixture	Substance
REACH registration number	01-2119490744-29
CAS No	646-06-0
EC No (EU Index No)	211-463-5
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use in polymer processing.
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8d - Wide dispersive outdoor use of processing aids in open systems
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC6 - Calendaring operations PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Sector(s) of use	SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
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Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	18000
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
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Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a full face respirator conforming to EN 136 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a full face respirator conforming to EN 136 with Type A filter or better Efficiency of at least 95%
Organisational measures to prevent	Assumes a good basic standard of occupational hygiene is implemented

/limit releases, dispersion and exposure	
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 80% Wear a full face respirator conforming to EN 136 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Process category(ies)	PROC6 - Calendaring operations
Covers concentrations up to	100%
Physical form of product	Liquid
Exposure duration	Avoid carrying out operation for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear a full face respirator conforming to EN 136 with Type A filter or better Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	19.7 mg/l
Freshwater sediment	77.7 mg/kg dwt
Marine water	1.97 mg/l
Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
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Freshwater	0.002 mg/l	< 0.01
Marine water	0.0002129 mg/l	< 0.01
Freshwater sediment	0.008 mg/kg dwt	< 0.01
Marine sediment	0.0008402 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.011 mg/l	< 0.01
Soil	0.00006611 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Calculation method	Used CHESAR model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.309 mg/m ³	0.016
PROC1 - Use in closed process, no likelihood of exposure	Worker - combined, long-term - systemic		0.026
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.067
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	3.087 mg/m ³	0.162
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - combined, long-term - systemic		0.229
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	1.645 mg/kg bw/day	0.401
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	9.26 mg/m ³	0.487
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - combined, long-term - systemic		0.888
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	2.742 mg/kg bw/day	0.669
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	3.858 mg/m ³	0.203
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - combined, long-term - systemic		0.872
PROC14 - Production of preparations	Worker - dermal, long-term -	0.082 mg/kg bw/day	0.02

or articles by tableting, compression, extrusion, pelettising	systemic		
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - inhalative, long-term - systemic	18.52 mg/m ³	0.975
PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising	Worker - combined, long-term - systemic		0.995
PROC6 - Calendaring operations	Worker - dermal, long-term - systemic	1.097 mg/kg bw/day	0.268
PROC6 - Calendaring operations	Worker - inhalative, long-term - systemic	6.173 mg/m ³	0.325
PROC6 - Calendaring operations	Worker - combined, long-term - systemic		0.593

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 1,3-Dioxolane
Pure substance/mixture Substance
REACH registration number 01-2119490744-29
CAS No 646-06-0
EC No (EU Index No) 211-463-5
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Consumer use
Type Consumer
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC8d - Wide dispersive outdoor use of processing aids in open systems
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 Pa (STP)
Vapour pressure	101 hPa

Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater 19.7 mg/l
Freshwater sediment 77.7 mg/kg dwt
Marine water 1.97 mg/l
Marine sediment 7.77 mg/kg dwt
Soil 2.62 mg/kg dwt
Impact on Sewage Treatment 1 mg/l

ES01915 - 1,3-dioxolane (211-463-5) - Consumer;
Consumer uses e.g. as a carrier in cosmetics/personal
care products, perfumes and fragrances. Note: For
cosmetic and personal care products, risk assessment
only required for the environment under REACH as
human health is covered by alternative legislation

Revision date 25-Mar-2026

Intermittent release 0.95 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.00228 mg/l	< 0.01
Marine water	0.000218 mg/l	< 0.01
Freshwater sediment	0.009 mg/kg dwt	< 0.01
Marine sediment	0.000862 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.00135 mg/l	0.01
Soil	0.0000423 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 1,3-Dioxolane
Pure substance/mixture Substance
REACH registration number 01-2119490744-29
CAS No 646-06-0
EC No (EU Index No) 211-463-5
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Pharmaceuticals
Type Consumer
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC8d - Wide dispersive outdoor use of processing aids in open systems
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Covers concentrations up to 100%

Product characteristics

Physical form of product	Liquid
Vapour pressure	101 hPa
Remarks	Dynamic viscosity < 10 mPa s Kinematic viscosity 9 mm ² /s

Other operational conditions of use affecting environmental exposure

Type	Continuous release
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Section 3 - Exposure estimation

Environmental release category(ies) - ERC8d - Wide dispersive outdoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Freshwater 19.7 mg/l
Freshwater sediment 77.7 mg/kg dwt
Marine water 1.97 mg/l

Marine sediment	7.77 mg/kg dwt
Soil	2.62 mg/kg dwt
Impact on Sewage Treatment	1 mg/l
Intermittent release	0.95 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.00215 mg/l	< 0.01
Marine water	0.000205 mg/l	< 0.01
Freshwater sediment	0.00745 mg/kg dwt	< 0.01
Marine sediment	0.000721 mg/kg dwt	< 0.01
STP: Sewage Treatment Plant	0.000403 mg/l	< 0.01
Soil	0.0000475 mg/kg dwt	< 0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2.6 mg/kg bw/d
Worker - inhalative, long-term - systemic	18.2 mg/m ³
Consumer - oral, long-term - systemic	1.31 mg/kg bw/d
Consumer - dermal, long-term - systemic	1.31 mg/kg bw/d
Consumer - inhalative, long-term - systemic	3.2 mg/m ³

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.