1.0 Identification of the substance/mixture and of the company

1.1 Product identifier

Trade name: Arc All Weather Sealant Brown
UFI: HN8E-5WWP-7J00-5FE3
Index-No.: --
EG-No.: --
CAS-No.: --
REACH-Registry-No.
Other names:--
This mixture contains nanoforms (according to REACH regulation).

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

Use as solvent containing Sealant by professional uses See also for this application the exposure scenario from of a supplier, bottler + *exposure scenario mineral oil distillate*

1.3 Details of the supplier of the data sheet

Manufacturer / Supplier
ARC Building Products
IDA Business & Technology Park
Ballynattin
Arklow, Co.Wicklow
Ireland.
Tel: +353 (0)402 32370
Email: sales@arcbuildingproducts.ie
Web: www.arcbuildingproducts.ie

1.4 Emergency Number

Tel: +353 (0)402 32370
(Office Hours Only)

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2. Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation 1272/2008/EU

Warning

Flam. Liq. Cat. 3, STOT SE 3
GHS 02, GHS 07, H 226, H 336, EUH 066

2.2 Label elements

Warning
Dangerous component contains : n-Butylacetate
Flammable Fluid category 3

Regulation 1228/2008/EU
H-Phrases
H226: Flammable liquid and vapour
H336: May cause drowsiness and dizziness
EUH-Phrases
EUH066: Repeated exposure may cause skin dryness or cracking

Precautionary statements
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P233: Keep container tightly closed
P403+P235: Store in a well-ventilated place. Keep cool.
P261: Avoid breathing dust/fume/ gas/mist/vapours/spray
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
P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing
P312: Call a POISON CENTRE / doctor if you feel unwell
P501 Dispose contents/ container to a plant for burning waste

2.3 Other hazards

Vapours may form explosive mixture with air Components of the product may be absorbed into the body by inhalation no endocrine Disruptors,
PBT- and vPvB-Assessment: there is no substance in the mixture to be persistent, bioaccumulating nor toxix (PBT), nor very persistent nor very bioaccumulating (vPvB)

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3. Composition/ information on integredients

Mixture: Synthetic rubber (Polymer mixture) and helping substances with the following hazardous Substances

Substance: Petroleum, Distillate
EC-No.: 265-157-1 CAS-No. : 64742-54-7 Index-No.:
REACH-Registry-Number.: 01-2119484627-25
Share : 31-35%

Classification according to Regulation (EU) No. 1272/2008: GHS 8, Asp. Tox. 1 H304
Highly refined mineral oil.
The highly refined mineral oil contains <3% (w/w) DMSO extract,
according to IP346. It is note H , L Annex VI

Substance: n-Butylacetate
EG-No.: 204-658-1 CAS-No. : 123-86-4 Index-No.:
REACH-Registry-Number.: 01-2119485493-29-0000
Share : 22-26%
Classification according to Regulation (EU) Nr. 1272/2008:
GHS 02 Flam. Liq. 3 H 226; GHS 07 STOT SE 3 H 336; EUH 066

Substance: Bis(2,2,6,6-tetramethyl-4-piperidyl)sebacate
EG-No: 258-207-9 CAS-Nr. : 52829-07-9 Index-Nr.:
REACH- Registry-Number: 01-2119537297-32-0001
Share : ca. 0,1-0,2%
Classification according to Regulation (EU) No. 1272/2008: GHS 05, 08, 09, Eye Dam.1 H318, Repr. 2 H361f, Aquatic Acute 1 H400, Aquatic Chronic 2 H 411 M acute = 1

Particle properties
Name of the (group of) nanoform(s):
Synthetic amorphous silica, nanostructured material.
Number-based particle size distribution (internal structure/primary particles)
D10: 7-15 nm
D50: 2-30 nm
D90: 10-35 nm

4. First aid measures

4.1 Description of first aid measures

Remove contaminated, soaked clothin immediately and dispose of safely. First aider need to protect himself.
After Inhalation Keep at rest. Aerate wirth fresh air. When symtoms persist or in all cases of doubt seek medical advice

Skin Wash immediately with soap and plenty of water. When symtoms persist or in all cases of doubt seek medical advice
Eyes Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.
Ingestion Call a physican immediately. Do not induce vomiting without medical advice.

4.2 Most important symtoms and effects, both acute and delayed

Cough, nausea, vomiting, headache,
Lung oedema, central nervous system effects. Prolonged skin contact may defat the skin and produce dermatitits

4.3 Indication of any immediate medical attention and special treatment needed

Treat symthomatically

5. Fire-fighting measures

5.1 Suitable extinguishing media: Alcohol-resistant foam, powder, carbon dioxide, water spray
Extinuishing media which must not be used for safety reasons: Do not use a solid water stream as it may scatter and spread fire

5.2 Special hazards arising from the substance or mixture:
Can be released in case of fire: carbon monoxide and carbon dioxide

5.3 Advice for fire-fighters
Wear self-contained breathing apparatus , like EN 133

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6. Accidental realease measures

6.1 Personal precautions
Avoid contact with skin and eyes. Avoid breathing vapors or mists. Keep people away from and upwind of spill/leak. Ensure adequate ventilation, especially in confined areas. Keep away from heat and sources of ignition.
For emergency responders: Personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage. Do not discharge product into the aquatic environment without pretreatment (biological treatment plant).

6.3 Methods for containment
Stop the flow of material, if possible without risk. Dike spilled material, where this is possible.
Methods for cleaning up
Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. If liquid has been spilt in
large quantities clean up promptly by scoop or vacuum. Dispose of in accordance with local regulations. Take
necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

6.4 Reference to other sections: see also section 7 and 13

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7. Handling and storage

7.1 Advice on safe handling
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Provide sufficient air exchange and/or exhaust in work rooms.

Advice on protection against fire and explosion
Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). In case of fire, emergency cooling with water spray should be available. Ground and bond containers when transferring material. Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback. Vapours may form explosive mixture with air.

Advice on the protection of the environment
See Section 8: Environmental exposure controls.

Advice on general occupational hygiene
Do not eat, drink and smoke in work

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions
Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care.
Don't store above 60 °C

Advice on common storage
Incompatible products: strong acids and strong bases
strong oxidizing agents
Temperature class T 2

7.3 Specific end uses: solvent containing sealant by professional use
See also Exposition scenario of the supplier to the containing solvent

---

8. Exposure controls / personal protection

8.1 Control parameters

8.1.1 Exposure Limits EC
According to Directive (EU) 2019/1831 of the Commission according to Directive 98/24/EG

Chemical Substance	*TWA (mg/m³)*	*TWA (ppm)*	*STEL(mg/m³)*	*STEL(ppm)*
n-Butylacetate CAS:123-86-4	*241*	*50*	*723*	*150*

Exposure Limits UK
Component:

n-Butylacetate	TWA(mg/m³)	TWA (ppm)	STEL(mg/m³)	STEL (ppm)	
CAS 123-86-4	724	150	966	200	UK
	710	150	950	200	Ireland

Silicon dioxide
CAS 7631-86-9 OEL 6mg/m³ Inhalable dust/mist OEL 2,4 mg/m³ respirable dust/mist
Mineral Oil (Fog)
CAS 64742-54-7 Mixture of hydrocarbons
ACGIH: TWA 5 mg/m³

Bariumsulphate CAS-No. 13462-86-7, Carbon Black CAS-No. 1333-86-4,
Titanium dioxide CAS-No. 13463-67-7, Iron oxide CAS-No. 1309-37-1, 1345-25-1

Titanium dioxide Limit value 8h
10 mg/m3 inhalable fraction (UK, Ireland)
4 mg/m3 respirable fraction (UK, Ireland)

Carbon black Limit value 8h
3,5 mg/m3 (UK)
3,5 mg/m3 (Ireland)

Bariumsulphate Limit value 8h

10 mg/m3 inhalable fraction (UK)
4 mg/m3 respirable fraction (UK)
1 mg/m3 (Ireland)

Iron oxide Limit value 8h
5 mg/m3 (UK, Ireland)
Note: For details and further information please refer to the original regulation.

8.1.2 DNEL- and PNEC- Data n-Butylacetate CAS 123-86-4
Worker
DN(M)EL - long-term exposure - systemic effects - Inhalation 300*** mg/m³***
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation 600*** mg/m³***
DN(M)EL - long-term exposure - local effects - Inhalation 300*** mg/m³
DN(M)EL - acute / short-term exposure - local effects - Inhalation 600*** mg/m³
DN(M)EL - long-term exposure - systemic effects - Dermal 11*** mg/kg bw/day***
DN(M)EL - acute / short-term exposure - systemic effects - Dermal 11*** mg/kg bw/day***
DN(M)EL - long-term exposure - local effects - Dermal No hazard identified***
DN(M)EL - acute / short-term exposure - local effects - Dermal No hazard identified***
DN(M)EL - local effects - eyes No hazard identified***

General population ***
DN(M)EL - long-term exposure - systemic effects - Inhalation 35,7*** mg/m³***
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation 300*** mg/m³***
DN(M)EL - long-term exposure - local effects - Inhalation 35,7*** mg/m³
DN(M)EL - acute / short-term exposure - local effects - Inhalation 300*** mg/m³
DN(M)EL - long-term exposure - systemic effects - Dermal 6*** mg/kg bw/day***
DN(M)EL - acute / short-term exposure - systemic effects - Dermal 6*** mg/kg bw/day***
DN(M)EL - long-term exposure - local effects - Dermal No hazard identified***
DN(M)EL - acute / short-term exposure - local effects - Dermal No hazard identified***
DN(M)EL - long-term exposure - systemic effects - Oral 2*** mg/kg bw/day***
DN(M)EL - acute / short-term exposure - systemic effects - Oral 2*** mg/kg bw/day***
DN(M)EL - local effects - eyes No hazard identified***

Environment ***
PNEC aqua - freshwater 0,18 mg/l
PNEC aqua - marine water 0,018 mg/l
PNEC aqua - intermittent releases 0,36 mg/l
PNEC STP 35,6 mg/l
PNEC sediment - freshwater 0,981 mg/kg
PNEC sediment - marine water 0,0981 mg/l
PNEC soil 0,0903 mg/kg
Secondary poisoning No potential for bioaccumulation***

DNEL Bis(2,2,6,6-tetramethyl-4-piperidyl)sebacate CAS-Number: 52829-07-9

Worker: long-term and short-term exposure - systemic effects - Inhalation: 2,82 mg/m3
Worker: long-term exposure - systemic effects , dermal: 1,6 mg/kg
General population: long-term exposure - systemic effects, Inhalation: 0,69 mg/m3
General population long-term exposure - systemic effects, dermal: 0,8 mg/kg
General population: long-term exposure - systemic effects, oral: 0,4 mg/kg

PNEC Bis(2,2,6,6-tetramethyl-4-piperidyl)sebacate CAS-Number: 52829-07-9
aqua - freshwater: 0,018 mg/l
marine water: 0,0018 mg/l
aqua - intermittent releases: 0,007 mg/l
sediment - freshwater 29 mg/kg
sediment - marine water: 2,9 mg/kg
Soil: 5,9 mg/kg
STPe: 1 mg/l

Data by supplier
Exposure limits European Union: for Silicon dioxide and Petroleum are no exposure limits established

8.2 Occupational exposure controls
8.2.1 Engineering measures

General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

8.2.2. Personal protective equipment
General industrial hygiene practice
Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Respiratory protection
Respirator with A filter. Full mask with above mentioned filter according to producers using requirements or self-contained breathing apparatus. Equipment should conform to EN 136 or EN 140 and EN 143.

Hand protection
Wear protective gloves. Recommendations are listed below. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

Suitable material butyl-rubber
Evaluation according to EN 374, level 3
Glove thickness approx 0,3 mm
Break through time approx **6**0 min
Suitable material polyvinylchloride /nitrile rubber
Evaluation according to EN 374, level 2
Glove thickness approx 0,9 mm
Break through time approx **3**0 min

Eye protection
Tightly fitting safety goggles. In addition to goggles, war a face shield if there ia a reasonable chance for splash to the face. Equipment should conform to EN 166.

Skin and body protection
Impervious clothing. Wear face-shield and protective suit for abnormal processing problems.
Note: the information to protection according to the dangerous substance n-Butylacetate

8.2.3 Environmental exposure controls If possible use in closed systems. If leakage can not be prevented, the substance needs to be suck off at the emersion point, if possible without danger. Observe the exposure limits, clean exhaust air if needed. If recycling is not practicable, dispose of in compliance with local regulations. Inform the responsible authorities in case of leakage into the atmosphere, or of entry into waterways, soil or drains

9. Physical and Chemical properties

9.1 Information on basic physical and chemical properties

Appearance	Liquid with high viscosity
- Aggregate state:	polymer, containing a solvent (liquid)
- color :	brown
Odor :	like Butylacetate
Odor threshold :	7-20 ppm (n-Butylacetate)
pH-value :	6,2 (n-Butylacetate data of supplier, pH not applicable to product)
Meltingpoint :	Not applicable
Bolingpoint and boiling range:	126 °C (solvent n-Butylacetate)
Flashpoint :	27 °C Vapor from n-Butylacetate, according to EC A.9)
Evapoating rate :	Not applicable
Flammability	Short-term ignition (5- 10 sec.) possible due to butyl acetate
Upper/lower flammability ore explosive limits:	1,2 % (lower limit n-Butylacetate) 7,5 % (upper limit n-Butylacetate)
Vapour pressure:	15 mbar bei 20 °C (n-Butylacetate)
Vapour densitiy :	4 (air =1) bei 20 °C (n-Butylacetate)
relative density :	0,94 g/cm^3 (20 °C)
Solubility :	Not soluble in water
Partition coefficient:	Not applicable
n-Octanol/Water :	Not applicable
Auto-ignition temperature :	Not applicable
Decomposition temperature:	Not applicable
Kinemat. Viscosity	>> 20,5 mm2/s 40 °C
Viscosity :	>15.000 mPas (20 °C) *Brookfield*
Explosive properties :	Not applicable
Oxidising properties :	Not applicable
Particle properties	Particle size distribution Number-based particle size distribution (internal structure/primary particles) D10: 7-15 nm D50: 2-30 nm D90: 10-35 nm Synthetic amorphous silica exists as a nanostructured material consisting of aggregates and agglomerates made up of fused primary particles

9.2 **Other information**
9.2.1 Information on physical hazard classes
Information not available.
9.2.2 Other safety characteristics
Evaporation rate Not determined
Molecular weight g/mol Undetermined
Total solids ---
Explosive properties non-explosive
Oxidising properties non-oxidising
VOC: approx. 24 %
Containing Solvent: approx. 24 % n-Butylacetate

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10. Stability and reactivity

10.1 Reactivity: no data known

10.2 Chemical Stability Stable if used and stored according to the specifications

10.3 Possibility of hazardous reactions: vapors can form with air explosive mixtures

10.4 Conditions to be avoid : strong acids and strong bases, also strong oxidants

10.5 Incompatible materials: no data known

10.6 Hazardous decomposition products: see also section 5

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11. Toxicological information

Acute Toxicity (all data corresponding to n-Butylacetate and Petroleum)
oral: LD50 10760 mg/kg (rat) OECD 423
dermal: LD50 >14000 mg/kg (rabbit) OECD 402
inhalative: LC0 23,4 mg/l (rat) OECD 403
Petroleum Toxicity: LD50 > 5000 mg/kg and in a matrix, no acute toxic effects
Irritation and Corrosion
Skin: no skin irritation (rabbit) OECD 404
Eye: no eye irritation (rabbit) OECD 405
Sensitization not sensitizing: skin, (guinea pig) OECD 406
Specific Target Organ Systemic Toxicant - Single exposure May cause drowsiness and dizziness
Specific Target Organ Systemic Toxicant - Repeated exposure
Repeated exposure may cause skin dryness or cracking.
Danger of aspiration: no, high viscosity of the product
Carcinogenicity, Mutagenicity, Reproductive toxicity (CMR): no effects, but see below
Additional toxicologial notes: dizziness, narcosis, cough, nausea, vomiting, headache, unconsciousness, shortness of breath. Components (n-butylacetate) of the product may be absorbed into the body by inhalation.
Data on carcinogenic, mutagenic and reproductive toxic properties (CMR properties) of the raw material Bis(2,2,6,6-tetramethyl-4-piperidyl)sebazate can probably affect fertility
11.2. Endocrine properties: currently no ingredient classified in this way

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12. Ecological information

12.1 Toxicity Fish toxicity LC50 18 mg/l (96h) (American Phoxinus phoxinus) OECD 203
Daphnia toxicity EC50 44 mg/l (48h) (Daphnia magna)
(Data from dangerous substance n-Butylacetate)

12.2 Persistence and degradability
Biodegradation 83 % (28 d), aerobic, Readily biodegradable, OECD 301 D.
(dangerous substance n-Butylacetate)

12.3 Bioaccumulative potential no data available

12.4 Mobility in soil no data available

12.6 Endocrinous properties currently unknown

12.7 Other harmful effects currently unknown

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13. Disposal considerations

13.1 Waste treatment methods

Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal

Uncleaned empty packaging: Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.
Empty plastic packaging: *150110*

European Waste Catalogue (EU)
08 04 09 waste adhesives and sealants containing organic solvents or other dangerous substances.
Extra caution: Leave waste to a dump or to a plant for burning waste

Other EU or national legislation *HP 03*

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14. Transport information

14.1 UN-Number 1133

14.2 Correct UN- proper shiping name: Adhesive*

14.3. Transport hazard class
Transport by Street /Rail
ADR/RID: not subjected to ADR/RID see 2.2.3.1.5.
(packaging < 450 l) no dangerous good
Class /Packaging group : no dangerous good
Accompanying documents: Meets the chemical and physical criteria set out in 2.2.3.1.5
ADR

Sea transport
IMDG-Code /GGV-See: not subjected to IMDG-Code 2.3.2.5 (packaging < 450 l)
No dangerous good
Class /Packaging group: no dangerous good
Accompanying documents Carriage in accordance with IMDG code 2.3.2.5

Air Transport: ICAO-TI / IATA-DGR
Class 3
Label 3
UN-Number 1133
Pakaging group III
Correct technical name: 1133 Adhesive*

14.4 Packaging group see 14.3

14.5 Enviromental hazards
ADR/RID / IMDG-Code / ICAO-TI / IATA-DGR: no
Marine Pollutant: no

14.6 Special precautions for user: no, see also section 7

14.7 Transport in bulk according to Annex II des MARPOL- 73/78 and the IBC-Code
Pollution category (X, Y or Z) : no
Ship type (1, 2 oder 3) : no

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15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
According to 1907/2006/EU

The mixture is not subject to regulations 1005/2009/EU, 2019/1021/EU (POP) and 649/2012/EU (PIC)

Classification according to Regulation 1272/2008/EU

Warning
Dangerous component contains : n-Butylacetate
Flammable Liquid category 3

National Regulation (Germany)
Wassergefährdungsklasse 1 (Solvent n-Butylacetate) AwSV
VOC: approx. 24 %
Lagerklasse by TRGS 510 : LGK 3

15.2 Chemical safety Assessment not be done yet *by Downstream User*

16. Other information

Changes compared to the latest version: Chapter 1,3,9 Changes, adapted to new regulations and classifications. Updating of the previous version due to adaptation to the regulations and classification of a raw material by the supplier.
Note: The above mentioned dates correspond to our present state of knowledge and experience. The safety data sheet serves as description of the products in regards to necessary safety measures. The indications have not the meaning of guarantees on properties.
All information (n-Butylacetate, mineral oil) is data from suppliers, also the exposure scenario
Date of issue 01.09.2023 Changes cursive Department Product Safety
Contact: info@baden-chemie.de

Specific hazards:
Flam. Liq. 3: Flammable liquids, Hazard Category 3
STOT SE 3: Specific target organ toxicity -Single exposure, Hazard Category 3
Asp. Tox. 1: Aspiration Toxicity 1

H-Phrases (raw materials)
H226: Flammable liquid and vapor
H304: May be fatal if swallowed and enters airways
H336: May cause drowsiness and dizziness
H 318 Causes serios eye damage
H 351 Suspected of causing cancer (inhale)
H 361f Suspected of damaging fertility
H 400 Very toxic to aquatic life
H 411 Toxic to aquatic life with long lasting effects
EUH-Phrases
EUH066: Repeated exposure may cause skin dryness or cracking

P-Phrases
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P233: Keep container tightly closed
P403+P235: Store in a well-ventilated place. Keep cool.
P261: Avoid breathing dust/fume/ gas/mist/vapours/spray
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
P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing
P312: Call a POISON CENTRE / doctor if you feel unwell
P501 Dispose contents/ container to a plant for burning waste

Global Inventory Status (GIS)
All components of the mixture are registered in or exempt from registration in the following registers
EU EINCS / REACH
USA TSCA active
Canada DSL/NDSL
Australia AICS

New Zealand NZIOC
PR China IECSC

Philippines PICCS
Switzerland

TSCA	United States TSCA Inventory
AIIC	Australian Inventory of Industrial Chemicals
DSL	Canadian Domestic Substances List (DSL)
ENCS	Japan. ENCS - Existing and New Chemical Substances Inventory
ISHL	Japan. ISHL - Inventory of Chemical Substances
KECI	Korea. Korean Existing Chemicals Inventory (KECI)
PICCS	Philippines Inventory of Chemicals and Chemical Substances (PICCS)
IECSC	China. Inventory of Existing Chemical Substances in China (IECSC)
NZIoC	New Zealand. Inventory of Chemical Substances

Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
CAS: Chemical Abstract Service
EINECS: European Inventory of Existing Commercial Chemical Substance
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
TRGS Technische Regel Gefahrstoffe (Germany)
VOC: Volatile Organic Compounds
DNEL: Derived No Effect Level
PNEC: Predicted No Effect Concentration

Annex to the extended Safety Data Sheet eSDS

For bottler ES 1 and professional Application in Coatings ES 4 an Exposure scenario (Oxea) for the dangerous substance n-Butylacetate (the product contains n-Butylacetate)

ES 1: Use for re-packing

Sector of uses [SU]
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)

Process categories [PROC]
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 (multistage 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 tabletting, compression, extrusion, pelettisation
PROC15: Use as laboratory reagent

Environmental release categories [ERC]
ERC2: Formulation of preparations (mixtures)

Product characteristics
Refer to attached safety data sheets

Processes and activities covered by the exposure scenario
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage,
materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling,
maintenanance and associated laboratory activities.***

Further explanations
Industrial use
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Assumes an advanced standard of occupational Health and Safety Management System***

Number of the contributing scenario 1
Contributing exposure scenario controlling environmental exposure for ERC 2

Further specification
SpERC ESVOC 2.2.v1 (ESVOC 4), release factors for (Sp)ERC were modified,
assessment tool used:, Chesar 2.3.***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP.
Amounts used
Daily amount per site: 13.33 to
Annual amount per site: 4000 to
Fraction of Regional tonnage used locally: 1
Frequency and duration of use
Covers use up to: 300 days***
Environment factors not influenced by risk management
River flow rate: 18000 m³/d Local freshwater dilution factor: 10 Local marine water dilution factor: 100
Technical conditions and measures at process level (source) to prevent release
Release fraction to air from process: 2.5 %
Release fraction to wastewater from process: 0.05 %
Release fraction to soil from process: 0.01%
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 90 %***
Conditions and measures related to municipal sewage treatment plant
Size of municipal sewage system/ treatment plant (m3/d): 2000
Estimated substance removal from wastewater via domestic sewage treatment (%): 88.9
Do not apply industrial sludge to natural soils***

Number of the contributing scenario 2
Contributing exposure scenario controlling worker exposure for
PROC 1
Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure 0,5 - 10 kPa at STP
Frequency and duration of use
8 h (full shift)
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 1 hand (240 cm²)***
Other given operational conditions affecting workers exposure
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Number of the contributing scenario 3***
Contributing exposure scenario controlling worker exposure for
PROC 2***
Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure 0,5 - 10 kPa at STP***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 2 hands (480 cm²)***
Other given operational conditions affecting workers exposure
Indoor and outdoor use***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Number of the contributing scenario 4***
Contributing exposure scenario controlling worker exposure for
PROC 3***
Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure 0,5 - 10 kPa at STP***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 1 hand (240 cm²)***
Other given operational conditions affecting workers exposure
Indoor and outdoor use***
Technical conditions and measures to control dispersion from source towardsthe worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Number of the contributing scenario 5***
Contributing exposure scenario controlling worker exposure for
PROC 4***

Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure 0,5 - 10 kPa at STP***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 2 hands (480 cm²)***
Other given operational conditions affecting workers exposure
Indoor and outdoor use***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).***
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.***

Number of the contributing scenario 6
Contributing exposure scenario controlling worker exposure for
PROC 5***

Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure 0,5 - 10 kPa at STP***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 2 hands (480 cm²)***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where
emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available,
respiratory protection (efficiency 90 %) must be used.***
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.***

Number of the contributing scenario 7***
Contributing exposure scenario controlling worker exposure for
PROC 8a***
Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure 0,5 - 10 kPa at STP***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to 2 hands (960 cm²)***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where

emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available,
respiratory protection (efficiency 90 %) must be used.***
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.***

Number of the contributing scenario 8***
Contributing exposure scenario controlling worker exposure for PROC 8b***
Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure 0,5 - 10 kPa at STP***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to 2 hands (960 cm²)***
Other given operational conditions affecting workers exposure
Indoor and outdoor use***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).***
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.***

Number of the contributing scenario 9***
Contributing exposure scenario controlling worker exposure for PROC 9***
Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure 0,5 - 10 kPa at STP***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 2 hands (480 cm²)***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust entilation): 90 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.***

Number of the contributing scenario 10
Contributing exposure scenario controlling worker exposure for PROC 14
Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure 0,5 - 10 kPa at STP***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 2 hands (480 cm²)***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where

emissions occur. Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative). If no adequate ventilation is available,
respiratory protection (efficiency 90 %) must be used.***

Number of the contributing scenario 11***
Contributing exposure scenario controlling worker exposure for PROC 15
Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure 0,5 - 10 kPa at STP***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 1 hand (240 cm²)***
Other given operational conditions affecting workers exposure
Indoor and outdoor use***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Exposure estimation and reference to its source
Environment
PEC = predicted environmental concentration (local); RCR = risk characterisation ratio
Fresh Water (Pelagic) PEC: 0.037 mg/l; RCR: 0.208
Fresh Water (Sediment) PEC: 0.75 mg/kg dw; RCR: 0.765
Marine Water (Pelagic) PEC: 0.004 mg/l; RCR: 0.208
Marine Water (Sediment) PEC: 0.075 mg/kg dw; RCR: 0.764
Agricultural Soil PEC: 0.012 mg/kg dw; RCR: 0.129
Sewage Treatment Plant(Effluent) PEC: 0.372 mg/l; RCR: 0.01

Human exposure prediction (oral, dermal, inhalative)
Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects. EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm): Estimated dermal long-term exposure [mg/kg b.w./d].***

Proc 1 EE(inhal): 0.194 ; EE(derm): 0.034***
Proc 2 EE(inhal): 96.8 ; EE(derm): 1.37***
Proc 3 EE(inhal): 193.6 ; EE(derm): 0.69***
Proc 4 EE(inhal): 387.2; EE(derm): 1.372***
Proc 5 EE(inhal): 96.8 ; EE(derm): 2.742***
Proc 8a EE(inhal): 96.8; EE(derm): 2.742***
Proc 8b EE(inhal): 484 ; EE(derm): 1.371***
Proc 9 EE(inhal): 96.8 ; EE(derm): 6.86***
Proc 14 EE(inhal): 96.8 ; EE(derm): 3.43***
Proc 15 EE(inhal): 193.6 ; EE(derm): 0.34***

Risk characterisation
RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio; total RCR= RCR(inhal) +RCR(derm). Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.***

Proc 1 RCR(inhal): 0.0003 ; RCR(derm): 0.003***
Proc 2 RCR(inhal): 0.161 ; RCR(derm): 0.124***
Proc 3 RCR(inhal): 0.323 ; RCR(derm): 0.063***
Proc 4 RCR(inhal): 0.645 ; RCR(derm): 0.125***
Proc 5 RCR(inhal): 0.161; RCR(derm): 0.249***
Proc 8a RCR(inhal): 0.161 ; RCR(derm): 0.249***
Proc 8b RCR(inhal): 0.807 ; RCR(derm): 0.125***
Proc 9 RCR(inhal): 0.161 ; RCR(derm): 0.624***
Proc 14 RCR(inhal): 0.161 ; RCR(derm): 0.312***
Proc 15 RCR(inhal): 0.323 ; RCR(derm): 0.031***

ES 4: professional Application in Coatings
List of use descriptors

Sector of uses [SU]
SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories [PROC]
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 (multistage 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
PROC15: Use as laboratory reagent
PROC19: Hand-mixing with intimate contact and only PPE available
Environmental release categories [ERC]
ERC8a: Wide dispersive indoor use of processing aids in open systems
Product characteristics
Refer to attached safety data sheets
Processes and activities covered by the exposure scenario
Covers the use in coatings (paints, inks, adhesives, etc) within closed or contained systems including incidental exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application activities and film
formation) and equipment cleaning, maintenance and associated laboratory activities.
Further explanations
Professional use
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Assumes a basic standard of occupational Health and Safety Management System***

Contributing Scenarios

Number of the contributing scenario 1
Contributing exposure scenario controlling environmental exposure for ERC 8a

Further specification
SpERC ESVOC 8.3b.v1 (ESVOC 6),

assessment tool used:, Chesar 2.3.***
Amounts used
daily wide dispersive use: 0.00055 to/d
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 0.0005
Amounts used (EU): 4000 to/a
Environment factors not influenced by risk management
River flow rate: 18000 m³/d Local freshwater dilution factor: 10 Local marine water dilution factor: 100
Other given operational conditions affecting environmental exposure
Indoor/Outdoor use***
Technical conditions and measures at process level (source) to prevent release
Release fraction to air from wide dispersive use (regional only): 98 %
Release fraction to wastewater from wide dispersive use: 1 %
Release fraction to soil from wide dispersive use (regional only): 1%***
Conditions and measures related to municipal sewage treatment plant
Size of municipal sewage system/ treatment plant (m3/d): 2000
The minimum grade of elimination in the sewage plant is (%): 88.9
Conditions and measures related to external treatment of waste for disposal
Dispose of waste product or used containers according to local regulations***

Number of the contributing scenario 2
Contributing exposure scenario controlling worker exposure for PROC 1

Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)
Frequency and duration of use
8 h (full shift)
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 1 hand (240 cm²)***
Other given operational conditions affecting workers exposure
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Number of the contributing scenario 3
Contributing exposure scenario controlling worker exposure for PROC 2
Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)***
Frequency and duration of use
8 h (full shift)
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 2 hands (480 cm²)***
Other given operational conditions affecting workers exposure
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Number of the contributing scenario 4
Contributing exposure scenario controlling worker exposure for PROC 3
Further specification
assessment tool used: Chesar 2.3***

Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)
Frequency and duration of use
8 h (full shift)
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 1 hand (240 cm²)***
Other given operational conditions affecting workers exposure
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Number of the contributing scenario 5***
Contributing exposure scenario controlling worker exposure for PROC 4

Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 2 hands (480 cm²)***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.***

Number of the contributing scenario 6***
Contributing exposure scenario controlling worker exposure for PROC 5

Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 2 hands (480 cm²)***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.*
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.***

Number of the contributing scenario 7***
Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to 2 hands (960 cm²)***

Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where
emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.***
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.***

Number of the contributing scenario 8***
Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to 2 hands (960 cm²)***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 90 %) must be used.***
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.***

Number of the contributing scenario 9***
Contributing exposure scenario controlling worker exposure for PROC 10

Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to 2 hands (960 cm²)***
Technical conditions and measures to control dispersion from source towards the worker
Provide extract ventilation to points where emissions occur. provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory
protection (efficiency 90 %) must be used.***
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.***

Number of the contributing scenario 10
Contributing exposure scenario controlling worker exposure for PROC 11

Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 25 %***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to hands and lower arms (1500 cm²)***
Other given operational conditions affecting workers exposure
Indoor and outdoor use***

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear respiratory protection(Efficiency: 95 %).***

Number of the contributing scenario 11***
Contributing exposure scenario controlling worker exposure for PROC 11
Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)
Liquid, vapour pressure 0,5 - 10 kPa at STP***
Frequency and duration of use
Avoid carrying out activities involving exposure for more than 4 hours***
Human factors not influenced by risk management
Area potentially exposed: corresponds to hands and lower arms (1500 cm²)***
Other given operational conditions affecting workers exposure
Indoor use***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative).***
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear respiratory protection(Efficiency: 90 %).***

Number of the contributing scenario 12***
Contributing exposure scenario controlling worker exposure for PROC 11
Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 25 %***
Frequency and duration of use
Avoid carrying out activities involving exposure for more than 4 hours***
Human factors not influenced by risk management
Area potentially exposed: corresponds to hands and lower arms (1500 cm²)***
Other given operational conditions affecting workers exposure
Indoor and outdoor use***
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear respiratory protection
(Efficiency: 95 %).***

Number of the contributing scenario 13***
Contributing exposure scenario controlling worker exposure for PROC 13
Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 25 %***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 2 hands (480 cm²)***
Other given operational conditions affecting workers exposure
Indoor use***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative).***

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.***

Number of the contributing scenario 14***

Contributing exposure scenario controlling worker exposure for 15

Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)***
Frequency and duration of use
8 h (full shift)***
Human factors not influenced by risk management
Area potentially exposed: corresponds to palm of 1 hand (240 cm²)***
Other given operational conditions affecting workers exposure
Indoor and outdoor use***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Number of the contributing scenario 15***

Contributing exposure scenario controlling worker exposure for PROC 19

Further specification
assessment tool used: Chesar 2.3***
Product characteristics
Liquid, vapour pressure 0,5 - 10 kPa at STP
Covers percentage substance in the product up to 100 % (unless stated differently)***
Frequency and duration of use
Avoid carrying out activities involving exposure for more than 4 hours***
Human factors not influenced by risk management
Area potentially exposed: corresponds to 1980 cm²***
Other given operational conditions affecting workers exposure
Indoor and outdoor use***
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).***
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant

Exposure estimation and reference to its source

Environment
PEC = predicted environmental concentration (local); RCR = risk characterisation ratio
Fresh Water (Pelagic) PEC: 0.0003 mg/l; RCR: 0.002
Fresh Water (Sediment) PEC: 0.006 mg/kg dw; RCR: 0.006
Marine Water (Pelagic) PEC: 0.0000 mg/l; RCR: 0.0002
Marine Water (Sediment) PEC: 0.0006 mg/kg dw; RCR: 0.006
Agricultural Soil PEC: 0.0001 mg/kg dw; RCR: 0.002
Sewage Treatment Plant(Effluent) PEC: 0.0003 mg/l; RCR: 0.0000

Human exposure prediction (oral, dermal, inhalative)
Oral exposure is not expected to occur. EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm):
Estimated dermal long-term exposure [mg/kg b.w./d]. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects.***

Proc 1 EE(inhal): 0.194; EE(derm): 0.034***
Proc 2 EE(inhal): 387.2; EE(derm): 1.37***
Proc 3 EE(inhal): 484; EE(derm): 0.69***

Proc 4 EE(inhal): 193.6; EE(derm): 6.86***
Proc 5 EE(inhal): 387.2; EE(derm): 2.742***
Proc 8a EE(inhal): 387.2; EE(derm): 2.742***
Proc 8b EE(inhal): 96.8; EE(derm): 2.742***
Proc 10 EE(inhal): 387.2; EE(derm): 2.743***
Proc 11 EE(inhal): 203.3; EE(derm): 6.428 - Contributing Scenarios 10
EE(inhal): 193.6; EE(derm): 6.428 - Contributing Scenarios 11
EE(inhal): 290.4; EE(derm): 3.857 - Contributing Scenarios 12***
Proc 13 EE(inhal): 232.3; EE(derm): 1.645***
Proc 15 EE(inhal): 193.6 ; EE(derm): 0.34***
Proc 19 EE(inhal): 135.5; EE(derm): 8.486***

Risk characterisation
RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio; total RCR= RCR(inhal) +RCR(derm). Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.***

Proc 1 RCR(inhal): 0.0003; RCR(derm): 0.003***
Proc 2 RCR(inhal): 0.645; RCR(derm): 0.124***
Proc 3 RCR(inhal): 0.807; RCR(derm): 0.063***
Proc 4 RCR(inhal): 0.323; RCR(derm): 0.624***
Proc 5 RCR(inhal): 0.645; RCR(derm): 0.249***
Proc 8a RCR(inhal): 0.645; RCR(derm): 0.249***
Proc 8b RCR(inhal): 0.161; RCR(derm): 0.249***
Proc 10 RCR(inhal): 0.645; RCR(derm): 0.249***
Proc 11 RCR(inhal): 0.339; RCR(derm): 0.584 - Contributing Scenarios 10
RCR(inhal): 0.323; RCR(derm): 0.584 - Contributing Scenarios 11
RCR(inhal): 0.484; RCR(derm): 0.351 - Contributing Scenarios 12***
Proc 13 RCR(inhal): 0.387; RCR(derm): 0.149***
Proc 15 RCR(inhal): 0.323; RCR(derm): 0.031***
Proc 19 RCR(inhal): 0.226; RCR(derm): 0.772***

Exposure Scenario mineral oil distillate Shell

Exposure Scenario – Worker

SECTION 1	EXPOSURE SCENARIO TITLE
Title	Formulation & (re)packing of substances and mixtures- Industrial
Use Descriptor	Sector of Use: SU 10 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 14, PROC 15 Environmental Release Categories: ERC2, ESVOC SpERC 2.2.v1
Scope of process	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Section 2.1	**Control of Worker Exposure**
Physical form of product	**Liquid, vapour pressure < 0.5 kPa with potential for aerosol generation**
Concentration of the Substance in Mixture/Article	**Covers use of substance/product up to 100% (unless stated differently).,**

Frequency and Duration of Use
Covers daily exposures up to 8 hours (unless stated differently).
Other Operational Conditions affecting Exposure
Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Assumes a good basic standard of occupational hygiene is implemented

Contributing Scenarios	**Risk Management Measures**
General measures (Aspiration)	Do not ingest. If swallowed then seek immediate medical assistance Risk Management Measures are based on qualitative risk characterisation.
General exposures (closed systems)	No other specific measures identified.
General exposures (open systems)	No other specific measures identified.
Batch processes at elevated temperaturesUse in contained batch processes	No other specific measures identified.
Process sampling	No other specific measures identified
Laboratory activities	No other specific measures identified.
Bulk transfersDedicated facility	No other specific measures identified.
Mixing operations (open systems)	No other specific measures identified.
ManualTransfer from/pouring from containersNon-dedicated facility	No other specific measures identified.
Drum/batch transfersDedicated facility	No other specific measures identified.
Production or preparation or articles by tabletting, compression, extrusion or pelletisation	No other specific measures identified.
Drum and small package filling	No other specific measures identified.
Equipment cleaning and maintenance	Drain down system prior to equipment opening or maintenance.
Storage.	Store substance within a closed system.

Section 2.2 **Control of Environmental Exposure**
Substance is complex UVCB.
Predominantly hydrophobic
Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	8.5E+05
Fraction of Regional tonnage used locally:	1
Annual site tonnage (tonnes/year):	3.0E+04
Maximum daily site tonnage (kg/day):	1.0E+05

Frequency and Duration of Use
Continuous release.
Emission Days (days/year): 300
Environmental factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other Operational Conditions affecting Environmental Exposure

Release fraction to air from process (initial release prior to RMM):	2.5E-03
Release fraction to wastewater from process (initial release prior to RMM):	5.0E-06
Release fraction to soil from process (initial release prior to RMM):	0.0001

Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
Risk from environmental exposure is driven by freshwater sediment.
Prevent discharge of undissolved substance to or recover from onsite wastewater.
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	69.5

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%) 0,0
Organisational measures to prevent/limit release from site
Do not apply industrial sludge to natural soils.
Sludge should be incinerated, contained or reclaimed.

Conditions and Measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment (%)	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.7
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	5.7E+05
Assumed domestic sewage treatment plant flow (m3/d)	2,000

Conditions and Measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or regional regulations.
Conditions and measures related to external recovery of waste
External recovery and recycling of waste should comply with applicable local and/or regional regulations

SECTION 3 EXPOSURE ESTIMATION
Section 3.1 - Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
Section 3.2 -Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

SECTION 4	**GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO**

Section 4.1 - Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Section 4.2 -Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

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SECTION 1	**EXPOSURE SCENARIO TITLE**
Title	Use as binders and release agents-Professional
Use Descriptor	Sector of Use: SU 22 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 6, PROC 8a, PROC 8b, PROC10, PROC11, PROC14 Environmental Release Categories: ERC8a, ERC8d, ESVOC SpERC 8.10b.v1
Scope of process	Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.

SECTION 2	**OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES**
Section 2.1	**Control of Worker Exposure**
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa with potential for aerosol generation.
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,

Frequency and Duration of Use
Covers daily exposures up to 8 hours (unless stated differently).
Other Operational Conditions affecting Exposure
Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Assumes a good basic standard of occupational hygiene is implemented

Contributing Scenarios	**Risk Management Measures**
General measures (Aspiration)	Do not ingest. If swallowed then seek immediate medical assistance
Material transfers(closed systems)	No other specific measures identified.
Drum/batch transfersDedicated facility	No other specific measures identified.

	Avoid carrying out activities involving exposure for more than 1 hour.
Drum/batch transfersNon-dedicated facility	No other specific measures identified.
Mixing operations (closed systems)	No other specific measures identified.
Mixing operations (open systems)	No other specific measures identified.
Mold forming	Provide extraction ventilation at points where emissions occur.
Casting operations(open systems)elevated temperature	Carry out in a vented booth or extracted enclosure.
SprayingMachine	Avoid carrying out activities involving exposure for more than 4 hours Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
SprayingManual	Avoid carrying out activities involving exposure for more than 1 hour. , or: Wear a respirator conforming to EN140 with Type A filter or better.
ManualRolling, Brushing	No other specific measures identified.
Equipment cleaning and maintenance	Drain down system prior to equipment opening or maintenance.
Storage.	Store substance within a closed system.

Section 2.2 Control of Environmental Exposure

Substance is complex UVCB.
Predominantly hydrophobic.

Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	2.7E+03
Fraction of Regional tonnage used locally:	1
Annual site tonnage (tonnes/year):	1.3E+00
Maximum daily site tonnage (kg/day):	3.7E+00

Frequency and Duration of Use

Continuous release.
Emission Days (days/year): 365

Environmental factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other Operational Conditions affecting Environmental Exposure

Release fraction to air from wide dispersive use (regional only):	0.95
Release fraction to wastewater from wide dispersive use:	0.025
Release fraction to soil from wide dispersive use (regional only):	0.025

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air

emissions and releases to soil
Risk from environmental exposure is driven by freshwater sediment.

Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	65.5
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%)	0

Organisational measures to prevent/limit release from site
Do not apply industrial sludge to natural soils.
Sludge should be incinerated, contained or reclaimed.
Conditions and Measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment (%)	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.7
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	2.4E+01
Assumed domestic sewage treatment plant flow (m3/d)	2,000

Conditions and Measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or regional regulations.
Conditions and measures related to external recovery of waste
External recovery and recycling of waste should comply with applicable local and/or regional regulations.

SECTION 3 EXPOSURE ESTIMATION

Section 3.1 - Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
Section 3.2 -Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

SECTION 4 GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO

Section 4.1 - Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Section 4.2 -Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite

technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).