SAFETY DATA SHEET

Annex II

Exposure scenario

Substance Name: 2-methylbutane

EC Number: 201-142-8

CAS Number: 78-78-4

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EXPOSURE ASSESSMENT

			Ident	ified u	ses	Result life cyc stage							
ES number	Volume (EU tonnes per year per use)	Manufacture	Formulation	End use	Consumer use	Service life (for articles)	Waste stage	Linked to Identified Use	Sector of Use (SU)	Preparation Category (PC)	Process category (PROC)	Article category (AC)	Environmental Release Category (ERC)
ES 1	3.68E+05	Х						01	3, 8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	NA	1, 4
ES 2	1.13E+05	Х						01a	3, 8, 9	NA	1, 2, 3, 4, 8a, 8b, 9, 15	NA	1, 2, 3, 4, 5, 6, 7
ES 3	1.12E+05		х					02	3, 10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	NA	2
ES 4	6.00E+00			х				03a	3	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 10, 13, 15	NA	4
ES 5	4.30E+01			х				04a	3	NA	1, 2, 3, 4, 7, 8a, 8b, 10, 13	NA	4
ES 6	9.59E+03			Х				09	3	NA	1, 2, 3, 8b, 9, 12	NA	4
ES 7	7.00E+02			Х				12b	22	NA	1, 2, 3, 8a, 8b, 16	NA	9a, 9b
ES 8	2.09E+05				Х			12c	21	13	NA	NA	9a, 9b
ES 9	4.60E+02			Х				13a	3	NA	1, 2, 3, 4, 8a, 8b, 9	NA	7
ES 10	2.25E+02			Х				13b	22	NA	1, 2, 3, 8a, 9, 20	NA	9a, 9b
ES 11	1.00E+02				Х			16	21	28, 39	NA	NA	8a, 8d
ES 12	5.00E+01			Х				17a	3	NA	10, 15	NA	2, 4
ES 13	5.01E+00			Х				17b	22	NA	10, 15	NA	8a

1.1 Manufacture of Substance – Industrial

1 1 1 Exposure Scenario

1.1.1 Exposure Scenario				
Section 1 Exposure Scenario Title Title				
Manufacture of Substance – Industrial				
Use Descriptor				
Sector(s) of Use		3, 8, 9		
Process Categories		1, 2, 3, 4, 8a, 8b, 15		
		Further information on the mapping and allocation of PROC codes is contained in Appendix 1.a.		
Environmental Release Categories		1, 4		
Specific Environmental Release Categ	ory	ESVOC 1.1.v1		
Processes, tasks, activities covered	· · · · · ·			
	ransfers, stora	iate or process chemical or extraction agent. age, sampling, associated laboratory activities, arge, road/rail car and bulk container).		
See Section 3.				
Risk Management Measures				
HIGH General exposures (closed systems) [CS15]	No specific	measures identified[EI18]		
General exposures (closed systems) [CS15] PROC2	No specific	measures identified[EI18]		
General exposures (closed systems) [CS15] PROC3	No specific	measures identified[EI18]		
General exposures (open systems) [CS16] PROC4	No specific measures identified[EI18]			
Process sampling [CS2] PROC8b	No specific	measures identified[EI18]		
Laboratory activities [CS36] No sper PROC15		measures identified[EI18]		
Bulk transfers[CS14](open No specif systems)[CS108] PROC8b		measures identified[EI18]		
Bulk transfers[CS14](open Systems)[CS108] PROC8b No specific measures identified[EI18]		measures identified[EI18]		
Bulk transfers[CS14](closed systems)[CS107] PROC8b	No specific measures identified[EI18]			
Equipment cleaning and maintenance[CS39] PROC8a				
Material storage[CS67] PROC1	No specific	measures identified[EI18]		
Material storage[CS67] PROC2	No specific	No specific measures identified[EI18]		
Section 2.2 Control of environment	al exposure			
Product characteristics				
Substance is isomeric mixture [Pr0	22].Predomina	antly hydrophobic [PrC4a].		
Amounts used				
Fraction of EU tonnage used in region 0.1				
Regional use tonnage (tonnes/year)	3.7e4			
Fraction of Regional tonnage used locally 1				
Annual site tonnage (tonnes/year) 3.7e4				
Maximum daily site tonnage (kg/day) 1.2e5				
Frequency and duration of use		I I		
Continuous release [FD2].				
Emission days (days/year) 300				

Environmental factors not influenced by risk management				
Local freshwater dilution factor	10			
Local marine water dilution factor	100			
Other given operational conditions affecting environmental exposure	•			
Release fraction to air from process (initial release prior to RMM)	5.0e-2			
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-4			
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 estimate	s used [TCS1].			
Technical onsite conditions and measures to reduce or limit discharges, air emis soil	sions and releases to			
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. Prundissolved substance to or recover from onsite wastewater [TCR14]. If dischard treatment plant, no onsite wastewater treatment required [TCR9].				
Treat air emission to provide a typical removal efficiency of (%)	90			
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%)	40.4			
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0			
Organisation measures to prevent/limit release from site				
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be inciner reclaimed [OMS3].	ated, contained or			
Conditions and measures related to municipal sewage treatment plant				
Estimated substance removal from wastewater via domestic sewage treatment (%)	97.1			
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97.1			
Maximum allowable site tonnage (M _{Safe}) based on release following total wastewater treatment removal (kg/d).	2.5e6			
Assumed domestic sewage treatment plant flow (m3/d)	10000			
Conditions and measures related to external treatment of waste for disposal				
During manufacturing no waste of the substance is generated. [ETW4]				
Conditions and measures related to external recovery of waste				
During manufacturing no waste of the substance is generated. [ERW2]				
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID section 13 – "LocalCSR" worksheet.				
Section 3 Exposure Estimation				
3.1. Health				
The ECETOC TRA tool has been used to estimate workplace exposures unless	otherwise indicated			
3.2. Environment				
The Hydrocarbon Block Method has been used to calculate environmental exposmodel [EE2].	sure with the Petrorisk			
Section 4 Guidance to check compliance with the Exposure Scenario				
4.1. Health				
Predicted exposures are not expected to exceed the DN(M)EL when the Risk M Measures/Operational Conditions outlined in Section 2 are implemented.	lanagement			

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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in factsheet for ESVOC 1.1.v1. Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file – "Site-Specific Production" worksheet [DSU6]

Exposure Estimation:

Human Health See Appendix A. **Environment** See PETRORISK file (Annex III).

1.2 Distribution of Substance - Industrial

1.2.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Distribution of Substance – Industrial	
Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Categories	1, 2, 3, 4, 8a, 8b, 9, 15 Further information on the mapping and allocation of PROC codes is contained in Appendix 1.a.
Environmental Release Categories	1, 2, 3, 4, 5, 6, 7
Specific Environmental Release Category	ESVOC 1.1b.v1
Processes, tasks, activities covered	il/road car and IBC loading) and ronacking (including

Bulk loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, maintenance and associated laboratory activities. Excludes emissions during transport.

Assessment Method

See Section 3.

Section 2	Operational conditions and risk management measures		
Section 2.1	Control of worker exposure		
Product characteristics			
Physical form of product	Liquid, vapour pressure >10KPa at STP [OC5]		
Concentration of substance in	Covers percentage substance in the product up to 100%		
product	(unless stated stated differently) [G13]		
Amounts used	No Limit		
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]		
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]		
	Assumes a good basic standard of occupational hygiene has been implemented [G1]		
Risk Management Measures			
General exposures (closed systems) [CS15] PROC1	No specific measures identified[EI18]		
General exposures (closed systems) [CS15] PROC2	No specific measures identified[EI18]		
General exposures (closed systems) [CS15] PROC3	No specific measures identified[EI18]		
General exposures (open systems) [CS16] PROC4	No specific measures identified[EI18]		
Process sampling [CS2] PROC3	No specific measures identified[EI18]		
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]		
Bulk transfers[CS14](closed systems)[CS107] PROC8b	No specific measures identified[EI18]		
Bulk transfers[CS14](open systems)[CS108] PROC8b	No specific measures identified[El18]		
Bulk transfers[CS14](open systems)[CS108] PROC8b	No specific measures identified[El18]		
Drum and small package filling[CS6] PROC9	No specific measures identified[El18]		
Equipment cleaning and maintenance[CS39] PROC8a	No specific measures identified[EI18]		

Material storage[CS67] PROC1	No specific measures identified[EI18]		
Material storage[CS67] PROC2	No specific measures identified[EI18]		
Material Storage[CS67] PROC2	No specific measures identified[E116]		
	the allocation of the identified OCs and RI	MMs is contained in	
Appendices 1 to 3 Section 2.2 Control of environment	al avnacura		
	ai exposure		
Product characteristics	201		
-	C2].Predominantly hydrophobic [PrC4a].		
Amounts used		1	
Fraction of EU tonnage used in region		0.1	
Regional use tonnage (tonnes/year)		1.1e4	
Fraction of Regional tonnage used loc	ally	2.0e-3	
Annual site tonnage (tonnes/year)		2.3e1	
Maximum daily site tonnage (kg/day)		1.1e3	
Frequency and duration of use			
Continuous release [FD2].			
Emission days (days/year)	St	20	
Environmental factors not influenced b	y risk management		
Local freshwater dilution factor		10	
Local marine water dilution factor		100	
Other given operational conditions affe	ecting environmental exposure		
Release fraction to air from process (in	nitial release prior to RMM)	1.0e-3	
Release fraction to wastewater from p	rocess (initial release prior to RMM)	1.0e-5	
Release fraction to soil from process (initial release prior to RMM)	0.00001	
Technical conditions and measures at	process level (source) to prevent release		
Common practices vary across sites the	nus conservative process release estimate	es used [TCS1].	
soil	ures to reduce or limit discharges, air emis driven by freshwater sediment [TCR1b].	sions and releases to	
No wastewater treatment required [TC			
Treat air emission to provide a typical	removal efficiency of (%)	90	
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency \geq (%)			
If discharging to domestic sewage treatment plant, provide the required onsite 0 wastewater removal efficiency of ≥ (%)			
Organisation measures to prevent/limi			
Do not apply industrial sludge to natur reclaimed [OMS3].	al soils [OMS2]. Sludge should be incinen	ated, contained or	
Conditions and measures related to m			
Estimated substance removal from wastewater via domestic sewage treatment (%)			
Total efficiency of removal from waster treatment plant) RMMs (%)	water after onsite and offsite (domestic	97.1	
Maximum allowable site tonnage (M _{Safe}) based on release following total wastewater treatment removal (kg/d).			
Assumed domestic sewage treatment plant flow (m3/d) 2000			
Conditions and measures related to ex	ternal treatment of waste for disposal	<u>.</u>	
External treatment and disposal of was [ETW3]	ste should comply with applicable local an	d/or national regulations.	
Conditions and measures related to ex			
[ERW1]	ste should comply with applicable local and		
Petrorisk file in IUCLID section 13 - "L	the allocation of the identified OCs and RI ocalCSR" worksheet.	VIMs is contained in	
Section 3 Exposure Estimation			
3.1. Health The Hydrocarbon Block Method has be	een used to calculate environmental expos	sure with the Detroriek	
THE INVITUGATION DIOCK MELLION HAS DE	sen useu to calculate environmental expos	oute with the Petronsk	

model [EE2].

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

Section 4 Guidance to check compliance with the Exposure Scenario

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.

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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in factsheet for ESVOC 1.1b.v1.

Exposure Estimation:

Human Health See Appendix A.

Environment

1.3 Formulation & (Re)packing of Substances and Mixtures – Industrial

1.3.1 Exposure Scenario

1.0.1 Exposure occinario	
Section 1 Exposure Scenario Title	
Title	
Formulation & (Re)packing of Substances and	Mixtures – Industrial
Use Descriptor	
Sector(s) of Use	3, 10
Process Categories	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15 Further information on the mapping and allocation of PROC codes is contained in Appendix 1.a.
Environmental Release Categories	2
Specific Environmental Release Category	ESVOC 2.2.v1
Processes, tasks, activities covered Formulation, packing and re-packing of the sub	estance and its mixtures in batch or continuous

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletization, extrusion, large and small scale packing, maintenance, sampling and associated laboratory activities Assessment Method

See Section 3.

See Section 3. Section 2	Operational conditions and risk management measures	
Section 2.1	Control of worker exposure	
Product characteristics		
Physical form of product	Liquid, vapour pressure >10KPa at STP [OC5]	
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated stated differently) [G13]	
Amounts used	No Limit	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]	
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]	
	Assumes a good basic standard of occupational hygiene has been implemented [G1]	
Risk Management Measures		
General exposures (closed systems) [CS15] PROC1	No specific measures identified[EI18]	
General exposures (closed systems) [CS15] PROC2	No specific measures identified[El18]	
General exposures (closed systems) [CS15] PROC3	No specific measures identified[EI18]	
General exposures (open systems) [CS16] PROC4	No specific measures identified[EI18]	
General exposures (open systems) [CS16] PROC4	No specific measures identified[EI18]	
Batch processes at elevated temperatures[CS136]Operation is carried out at elevated temperature (> then 20°C above ambient temperature)[OC7] PROC3	No specific measures identified[EI18]	
Process sampling [CS2] PROC3	No specific measures identified[EI18]	
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]	

Laboratory activities [CS36] No specific measures identified[EI18] PROC15						
Bulk transfers[CS14] PROC8b No specific measures identified[El18]						
Mixing operations (open systems)[CS30] PROC5						
Manual[CS34]Transfer from/pouring from containers [CS22] PROC8a						
Drum/batch transfers [CS8] PROC8b	Drum/batch transfers [CS8] No specific measures identified[El18]					
Appendices 1 to 3	r the allocation of the identified OCs and RI	MMs is contained in				
Section 2.2 Control of environmen	ital exposure					
Product characteristics						
Substance is isomeric mixture [Pr	C2].Predominantly hydrophobic [PrC4a].					
Amounts used						
Fraction of EU tonnage used in region	n	0.1				
Regional use tonnage (tonnes/year)		1.1e4				
Fraction of Regional tonnage used lo	cally	1				
Annual site tonnage (tonnes/year)	***	1.1e4				
Maximum daily site tonnage (kg/day)		3.7e4				
Frequency and duration of use						
Continuous release [FD2].						
Emission days (days/year)		300				
Environmental factors not influenced	by risk management					
Local freshwater dilution factor						
Local marine water dilution factor		100				
Other given operational conditions affecting environmental exposure						
Release fraction to air from process (EU Solvent Emissions Directive requi	after typical onsite RMMs, consistent with irements)	2.5e-2				
Release fraction to wastewater from	2.0e-4					
Release fraction to soil from process	0.0001					
Technical conditions and measures at process level (source) to prevent release						
Common practices vary across sites	Common practices vary across sites thus conservative process release estimates used [TCS1].					
	sures to reduce or limit discharges, air emis					
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR9].						
Treat air emission to provide a typical removal efficiency of (%)						
Treat onsite wastewater (prior to receiving water discharge) to provide the 41.2						
required removal efficiency ≥ (%) If discharging to domestic sewage treatment plant, provide the required onsite 0						
wastewater removal efficiency of ≥ (%)						
Organisation measures to prevent/limit release from site						
Do not apply industrial sludge to natureclaimed [OMS3].	ral soils [OMS2]. Sludge should be inciner	ated, contained or				
Conditions and measures related to municipal sewage treatment plant						
Estimated substance removal from w (%)	astewater via domestic sewage treatment	97.1				
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)						
Maximum allowable site tonnage (M _{Safe}) based on release following total wastewater treatment removal (kg/d). 7.5e5						
Assumed domestic sewage treatmen	t plant flow (m3/d)	2000				

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations. [ETW3]

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1]

Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID section 13 – "LocalCSR" worksheet.

Section 3 Exposure Estimation

3.1. Health

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

Section 4 Guidance to check compliance with the Exposure Scenario

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.

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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in factsheet for ESVOC 2.2.v1.

Exposure Estimation:

Human Health

See Appendix A.

Environment

1.4 Uses in Coatings – Industrial

1.4.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Uses in Coatings – Industrial	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15 Further information on the mapping and allocation of PROC codes is contained in Appendix 1.a.
Environmental Release Categories	4
Specific Environmental Release Category	ESVOC 4.3a.v1
Decrees tools settiffed account	

Processes, tasks, activities covered

Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.

Assessment Method

See Section 3.

See Section 3. Section 2	Operational conditions and risk management measures	
Section 2.1	Control of worker exposure	
Product characteristics		
Physical form of product	Liquid, vapour pressure >10KPa at STP [OC5]	
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated stated differently) [G13]	
Amounts used	No Limit	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]	
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]	
	Assumes a good basic standard of occupational hygiene has been implemented [G1]	
Risk Management Measures		
General exposures (closed systems) [CS15] PROC1	No specific measures identified[EI18]	
General exposures (closed systems) [CS15]with sample collection[CS56]Use in contained systems[CS38] PROC2	No specific measures identified[El18]	
Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing[CS94]Operation is carried out at elevated temperature (> then 20°C above ambient temperature)[OC7] PROC2	No specific measures identified[El18]	
Mixing operations (closed systems)[CS29]General exposures (closed systems) [CS15] PROC3	No specific measures identified[EI18]	
Film formation - air drying[CS95] PROC4	No specific measures identified[EI18]	
Film formation - air drying[CS95] PROC4	No specific measures identified[EI18]	
Preparation of material for application[CS96]Mixing operations (open systems)[CS30] PROC5	No specific measures identified[EI18]	

Preparation of material for application[CS96]Mixing operations (open systems)[CS30] PROC5	No specific measures identified[EI18]			
Spraying (automatic/robotic)[CS97] PROC7	No specific measures identified[EI18]			
Manual [CS34]. Spraying[CS10] PROC7	No specific measures identified[EI18]			
Material transfers [CS3] PROC8a	No specific measures identified[EI18]			
Material transfers [CS3] PROC8a	No specific measures identified[EI18]			
Material transfers [CS3] PROC8b	No specific measures identified[EI18]			
Roller, spreader, flow application[CS98] PROC10	No specific measures identified[EI18]			
Dipping, immersion and pouring[CS4] PROC13	No specific measures identified[EI18]			
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]			
Material transfers [CS3]Drum/batch transfers [CS8]Transfer from/pouring from containers [CS22] PROC9	No specific measures identified[EI18]			
Material transfers [CS3]Drum/batch transfers [CS8]Transfer from/pouring from containers [CS22] PROC9	No specific measures identified[EI18]			
Production or preparation or articles by tabletting, compression, extrusion or pelletisation[CS100] PROC14	No specific measures identified[EI18]			
Production or preparation or articles by tabletting, compression, extrusion or pelletisation[CS100] PROC14	No specific measures identified[EI18]			
Additional information on the basis for the Appendices 1 to 3 Section 2.2 Control of environmental expressions are supported by the section 2.2 Control of environmental expressions.	Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3			
	Apoca. 5			
Product characteristics	01 p d			
	2].Predominantly hydrophobic [PrC4a].			
Amounts used		0.1		
	Fraction of EU tonnage used in region			
Regional use tonnage (tonnes/year)		6.0e-1		
Fraction of Regional tonnage used local	ally	1 6.00.1		
Annual site tonnage (tonnes/year) Maximum daily site tonnage (kg/day)		6.0e-1 3.0e-1		
3 (3)		J.UE- I		
Frequency and duration of use Continuous release [FD2].				
Emission days (days/year)		20		
Environmental factors not influenced by risk management				
Local freshwater dilution factor 10				
Local freshwater dilution factor Local marine water dilution factor		100		

Other given operational conditions affecting environmental exposure			
Release fraction to air from process (initial release prior to RMM)	0.98		
Release fraction to wastewater from process (initial release prior to RMM)	7.0e-4		
Release fraction to soil from process (initial release prior to RMM)	0		
Technical conditions and measures at process level (source) to prevent release			
Common practices vary across sites thus conservative process release estimates	s used [TCS1].		
Technical onsite conditions and measures to reduce or limit discharges, air emiss			
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. Pre undissolved substance to or recover from onsite wastewater [TCR14]. No wastew [TCR6].	event discharge of vater treatment required		
Treat air emission to provide a typical removal efficiency of (%)	90		
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency \geq (%)	0		
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0		
Organisation measures to prevent/limit release from site			
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incineral reclaimed [OMS3].	ted, contained or		
Conditions and measures related to municipal sewage treatment plant			
Estimated substance removal from wastewater via domestic sewage treatment (%) 97.1			
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)			
Maximum allowable site tonnage (M _{Safe}) based on release following total wastewater treatment removal (kg/d).	2.1e5		
Assumed domestic sewage treatment plant flow (m3/d)	2000		
Conditions and measures related to external treatment of waste for disposal			
External treatment and disposal of waste should comply with applicable local and/or national regulations. [ETW3]			
Conditions and measures related to external recovery of waste			
External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1]			
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID section 13 – "LocalCSR" worksheet.			
Section 3 Exposure Estimation			
3.1. Health			
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated			
3.2. Environment			
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk			

Section 4 Guidance to check compliance with the Exposure Scenario

4.1. Health

model [EE2].

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.

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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in factsheet for ESVOC SpERC 4.3a.v1.

Exposure Estimation:

Human Health

See Appendix A.

Environment

1.5 Uses in Cleaning Agents – Industrial

1.5.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Use in Cleaning Agents – Industrial	
Use Descriptor	
Sector(s) of Use	3
Process Categories	2, 3, 4, 7, 8a, 8b, 10, 13 Further information on the mapping and allocation of PROC codes is contained in Appendix 1.a.
Environmental Release Categories	4
Specific Environmental Release Category	ESVOC 4.4a.v1
Processes tasks activities covered	•

Processes, tasks, activities covered

Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. Exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.

Assessment Method

See Section 3

See Section 3.		
Section 2	Operational conditions and risk management measures	
Section 2.1	Control of worker exposure	
Product characteristics		
Physical form of product	Liquid, vapour pressure >10KPa at STP [OC5]	
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated stated differently) [G13]	
Amounts used	No Limit	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]	
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]	
	Assumes a good basic standard of occupational hygiene has been implemented [G1]	
Risk Management Measures		
Bulk transfers[CS14] PROC8a	No specific measures identified[EI18]	
Bulk transfers[CS14] PROC8a	No specific measures identified[EI18]	
Automated process with (semi) closed systems.[CS93]Use in contained systems[CS38] PROC2	No specific measures identified[EI18]	
Automated process with (semi) closed systems.[CS93]Use in contained systems[CS38] PROC2	No specific measures identified[El18]	
Automated process with (semi) closed systems.[CS93]Drum/batch transfers [CS8] PROC3	No specific measures identified[El18]	
Automated process with (semi) closed systems.[CS93]Drum/batch transfers [CS8] PROC3	No specific measures identified[EI18]	
Application of cleaning products in closed systems [CS101] PROC2	No specific measures identified[El18]	
Application of cleaning products in closed systems [CS101] PROC2	No specific measures identified[EI18]	

Other given operational conditions affecting environmental exposure		
		10
Environmental factors not influenced by r	ізк шападетепт	140
Emission days (days/year)	iak managament	20
Continuous release [FD2].		T
Frequency and duration of use		
Maximum daily site tonnage (kg/day)		2.2e2
Annual site tonnage (tonnes/year)		4.3e0
Fraction of Regional tonnage used locally	у	1
Regional use tonnage (tonnes/year)		4.3e0
Fraction of EU tonnage used in region		0.1
Amounts used	in recommently hydrophobic [r 104d].	
Substance is isomeric mixture [PrC2]	Predominantly hydrophobic [PrC4a]	
Product characteristics		
Appendices 1 to 3 Section 2.2 Control of environmental	exposure	
Additional information on the basis for the	e allocation of the identified OCs and R	MMs is contained in
J. 1 , 7 J. 111		
Manual[CS34]Surfaces[CS48]Cleanin g[CS47]no spraying[CS60] PROC10	No specific measures identified[El18	
g[CS47]no spraying[CS60] PROC10		
Manual[CS34]Surfaces[CS48]Cleanin	No specific measures identified[EI18	1
Cleaning with high pressure washers [CS44] PROC7	No specific measures identified[EI18	1
Cleaning with high pressure washers [CS44] PROC7	No specific measures identified[EI18	I
washers[CS42] PROC10		
Cleaning with low-pressure	No specific measures identified[EI18	1
Cleaning with low-pressure washers[CS42] PROC10	No specific measures identified[EI18	I
Degreasing small objects in cleaning station[CS41] PROC13	No specific measures identified[EI18	
Degreasing small objects in cleaning station[CS41] PROC13	No specific measures identified[EI18	
Use in contained batch processes [CS37] PROC4	No specific measures identified[EI18	
Use in contained batch processes [CS37] PROC4	No specific measures identified[EI18	
Filling / preparation of equipment from drums or containers.[CS45] PROC8b	No specific measures identified[EI18	
ETP / C	No. 2007 Control of the CC of FELAC	1

Release fraction to air from process (initial release prior to RMM)	1.0	
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-6	
Release fraction to soil from process (initial release prior to RMM)	0	
Technical conditions and measures at process level (source) to prevent release	1	
Common practices vary across sites thus conservative process release estimates used [TCS1].		
Technical onsite conditions and measures to reduce or limit discharges, air emis soil		
Risk from environmental exposure is driven by freshwater [TCR1a]. Prevent disc substance to or recover from onsite wastewater [TCR14]. No wastewater treatme		
Treat air emission to provide a typical removal efficiency of (%)	70	
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%)	0	
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0	
Organisation measures to prevent/limit release from site	L	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incineral reclaimed [OMS3].	ated, contained or	
Conditions and measures related to municipal sewage treatment plant		
Estimated substance removal from wastewater via domestic sewage treatment (%)	97.1	
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97.1	
Maximum allowable site tonnage (M _{Safe}) based on release following total wastewater treatment removal (kg/d).	1.5e7	
Assumed domestic sewage treatment plant flow (m3/d)	2000	
Conditions and measures related to external treatment of waste for disposal		
External treatment and disposal of waste should comply with applicable local and/or national regulations. [ETW3]		
Conditions and measures related to external recovery of waste		
External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1]		
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID section 13 – "LocalCSR" worksheet.		
Section 3 Exposure Estimation		
3.1. Health		
The ECETOC TRA tool has been used to estimate workplace exposures unless	otherwise indicated.	
3.2. Environment		
The Hydrocarbon Block Method has been used to calculate environmental exposmodel [EE2].	sure with the Petrorisk	
Section 4 Guidance to check compliance with the Exposure Scenario		
4.1. Health		
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Ma Measures/Operational Conditions outlined in Section 2 are implemented.	anagement	

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.

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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in factsheet for ESVOC 4.4a.v1.

Exposure Estimation:

Human Health

See Appendix 2.b.

Environment

1.6 Use as a Blowing Agent – Industrial 1.6.1 Exposure Scenario

1.0.1 Exposure occitains	
Section 1 Exposure Scenario Title	
Title	
Use as a Blowing Agent – Industrial	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 8b, 9, 12 Further information on the mapping and allocation of PROC codes is contained in Appendix 1.a.
Environmental Release Categories	4

Specific Environmental Release Category
Processes, tasks, activities covered

Use as a blowing agent for rigid and flexible foams, including material transfers, mixing and injection, curing, cutting, storage and packing.

ESVOC 4.9.v1

Assessment Method

See Section 3.	
Section 2	Operational conditions and risk management messures
Section 2.1	Operational conditions and risk management measures Control of worker exposure
Product characteristics	Control of worker exposure
Physical form of product	Liquid, vapour pressure >10KPa at STP [OC5]
Concentration of substance in	Covers percentage substance in the product up to 100%
product	(unless stated stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions	Assumes use at not > 20oC above ambient [G15]
affecting worker exposure	Assumes use at not > 2000 above ambient [O 10]
ancoung worker exposure	Assumes a good basic standard of occupational hygiene has been implemented [G1]
Risk Management Measures	
Bulk transfers[CS14] PROC8b	No specific measures identified[EI18]
Mixing operations (closed systems)[CS29] PROC1	No specific measures identified[EI18]
Extrusion and expansion of polymer mass[CS122] PROC12	No specific measures identified[EI18]
Cutting and shaving[CS134] PROC12	No specific measures identified[EI18]
Collection and re-processing of	No specific measures identified[EI18]
shavings, cuttings, etc[CS123] PROC12	
Product packaging[CS124] PROC12	No specific measures identified[EI18]
Material storage[CS67] PROC12	No specific measures identified[EI18]
Mixing operations (closed systems)[CS29]Operation is carried out at elevated temperature (> then 20°C above ambient temperature)[OC7] PROC3	No specific measures identified[EI18]
Intermediate polymer storage [CS66]Operation is carried out at elevated temperature (> then 20°C above ambient temperature)[OC7] PROC3	No specific measures identified[El18]
Centrifuging including discharging[CS127]Operation is carried out at elevated temperature (> then 20°C above ambient temperature)[OC7] PROC3	No specific measures identified[El18]
Drying and storage [CS12] PROC12	No specific measures identified[EI18]
Semi-bulk packaging[CS128] PROC8b	No specific measures identified[EI18]
Treatment by heating[CS129]Operation is carried out at elevated temperature (> then 20°C above ambient	No specific measures identified[El18]

temperature)[OC7] PROC12			
Drying and storage [CS12] PROC12	No specific measures identified[EI18]		
Article formation in mould (re-	No specific measures identified[EI18]		
wording of			
CS89?)[CS130]Operation is carried			
out at elevated temperature (> then			
20°C above ambient			
temperature)[OC7] PROC12	No analific management identifical(E140)		
Cutting by heated	No specific measures identified[EI18]		
wire[CS131]Manual[CS34] PROC12 Mixing operations (closed	No specific measures identified[EI18]		
systems)[CS29] PROC3	No specific measures identified[E116]		
Drum and small package	No specific measures identified[EI18]		
filling[CS6]Filling / preparation of	No specific measures identified[Li10]		
equipment from drums or			
containers.[CS45] PROC9			
Foaming[CS132] PROC12	No specific measures identified[EI18]		
Compression[CS133] PROC12	No specific measures identified[EI18]		
Cutting by heated wire[CS131]	No specific measures identified[EI18]		
PROC12			
	the allocation of the identified OCs and RI	MMs is contained in	
Appendices 1 to 3		-	
Section 2.2 Control of environmental	exposure		
Product characteristics			
Substance is isomeric mixture [PrC	2].Predominantly hydrophobic [PrC4a].		
Amounts used	, , , , , , , , , , , , , , , , , , , ,		
Fraction of EU tonnage used in region		0.1	
Regional use tonnage (tonnes/year)		9.6e2	
Fraction of Regional tonnage used loca	ally	1	
Annual site tonnage (tonnes/year)		9.6e2	
Maximum daily site tonnage (kg/day)		4.8e4	
Frequency and duration of use			
Continuous release [FD2].			
Emission days (days/year) 20			
Environmental factors not influenced by risk management			
Local freshwater dilution factor	10		
Local marine water dilution factor 100			
Other given operational conditions affecting environmental exposure			
Release fraction to air from process (initial release prior to RMM) 1.0			
Release fraction to wastewater from pr		3.0e-5	
Release fraction to soil from process (i		0	
Technical conditions and measures at process level (source) to prevent release			
	ius conservative process release estimate	s used LLCS1I.	
	res to reduce or limit discharges, air emis		
soil		sions and releases to	
soil Risk from environmental exposure is d	riven by freshwater sediment [TCR1b]. Pr	sions and releases to revent discharge of	
soil Risk from environmental exposure is d undissolved substance to or recover from		sions and releases to revent discharge of	
soil Risk from environmental exposure is d undissolved substance to or recover frequired [TCR6].	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastew	sions and releases to revent discharge of water treatment	
soil Risk from environmental exposure is d undissolved substance to or recover frequired [TCR6]. Treat air emission to provide a typical recover.	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR14].	revent discharge of water treatment	
soil Risk from environmental exposure is d undissolved substance to or recover frequired [TCR6]. Treat air emission to provide a typical r Treat onsite wastewater (prior to receive	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR14].	sions and releases to revent discharge of water treatment	
soil Risk from environmental exposure is d undissolved substance to or recover frequired [TCR6]. Treat air emission to provide a typical r Treat onsite wastewater (prior to receive required removal efficiency ≥ (%)	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR14] wastewater [TCR14]. No wastewater [TCR14] wastewater [TCR14]. No wastewater [TCR14] wastewater [TCR16] to provide the	revent discharge of water treatment	
soil Risk from environmental exposure is d undissolved substance to or recover frequired [TCR6]. Treat air emission to provide a typical r Treat onsite wastewater (prior to receive required removal efficiency ≥ (%) If discharging to domestic sewage trea	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR14]. No wastewater [TCR14] wastewater [TCR14]. No wastewater [TCR14] wastewater [TCR16]. No wastewater [TCR16] to provide the them.	revent discharge of water treatment	
soil Risk from environmental exposure is d undissolved substance to or recover frequired [TCR6]. Treat air emission to provide a typical r Treat onsite wastewater (prior to receive required removal efficiency ≥ (%) If discharging to domestic sewage treat wastewater removal efficiency of ≥ (%)	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR14]. No wastewater [TCR14] wastewater [TCR14]. No wastewater [TCR14] wastewater [TCR16]. No wastewater [TCR16] to provide the themselved that the plant, provide the required onsite [TCR16].	revent discharge of water treatment	
soil Risk from environmental exposure is d undissolved substance to or recover frequired [TCR6]. Treat air emission to provide a typical r Treat onsite wastewater (prior to receive required removal efficiency ≥ (%) If discharging to domestic sewage treat wastewater removal efficiency of ≥ (%) Organisation measures to prevent/limit	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR14]. No wastewater [TCR14]. No wastewater [TCR14]. No wastewater emoval efficiency of (%) ring water discharge) to provide the truent plant, provide the required onsite a release from site	sions and releases to revent discharge of water treatment 0 0 0	
soil Risk from environmental exposure is d undissolved substance to or recover frequired [TCR6]. Treat air emission to provide a typical required removal efficiency ≥ (%) If discharging to domestic sewage trea wastewater removal efficiency of ≥ (%) Organisation measures to prevent/limit Do not apply industrial sludge to natura	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR14]. No wastewater [TCR14] wastewater [TCR14]. No wastewater [TCR14] wastewater [TCR16]. No wastewater [TCR16] to provide the themselved that the plant, provide the required onsite [TCR16].	sions and releases to revent discharge of water treatment 0 0 0	
soil Risk from environmental exposure is d undissolved substance to or recover frequired [TCR6]. Treat air emission to provide a typical r Treat onsite wastewater (prior to receive required removal efficiency ≥ (%) If discharging to domestic sewage treat wastewater removal efficiency of ≥ (%) Organisation measures to prevent/limit Do not apply industrial sludge to natural reclaimed [OMS3].	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR16]. No wastewater [TCR16]	sions and releases to revent discharge of water treatment 0 0 0	
soil Risk from environmental exposure is d undissolved substance to or recover frequired [TCR6]. Treat air emission to provide a typical r Treat onsite wastewater (prior to receive required removal efficiency ≥ (%) If discharging to domestic sewage treat wastewater removal efficiency of ≥ (%) Organisation measures to prevent/limit Do not apply industrial sludge to natural reclaimed [OMS3]. Conditions and measures related to me	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater discharge) to provide the timent plant, provide the required onsite [Telease from site all soils [OMS2]. Sludge should be incineral unicipal sewage treatment plant	sions and releases to revent discharge of water treatment 0 0 0	
soil Risk from environmental exposure is d undissolved substance to or recover frequired [TCR6]. Treat air emission to provide a typical r Treat onsite wastewater (prior to receive required removal efficiency ≥ (%) If discharging to domestic sewage treat wastewater removal efficiency of ≥ (%) Organisation measures to prevent/limited Do not apply industrial sludge to natural reclaimed [OMS3]. Conditions and measures related to measures related to measures.	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR16]. No wastewater [TCR16]	sions and releases to revent discharge of water treatment 0 0 0 ated, contained or	
Risk from environmental exposure is d undissolved substance to or recover for required [TCR6]. Treat air emission to provide a typical of the Treat onsite wastewater (prior to receive required removal efficiency ≥ (%) If discharging to domestic sewage treat wastewater removal efficiency of ≥ (%) Organisation measures to prevent/limit Do not apply industrial sludge to natural reclaimed [OMS3]. Conditions and measures related to measures related substance removal from was (%)	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater discharge) to provide the timent plant, provide the required onsite [Telease from site all soils [OMS2]. Sludge should be incineral unicipal sewage treatment plant	sions and releases to revent discharge of water treatment 0 0 0 ated, contained or	
Risk from environmental exposure is dundissolved substance to or recover frequired [TCR6]. Treat air emission to provide a typical required removal efficiency ≥ (%) If discharging to domestic sewage trea wastewater removal efficiency of ≥ (%) Organisation measures to prevent/limit Do not apply industrial sludge to natura reclaimed [OMS3]. Conditions and measures related to mit Estimated substance removal from was (%) Total efficiency of removal from wastev treatment plant) RMMs (%)	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR14]. No wastewater [TCR14]. No wastewater discharge) to provide the strength of the st	sions and releases to revent discharge of water treatment 0 0 0 ated, contained or	
Risk from environmental exposure is d undissolved substance to or recover for required [TCR6]. Treat air emission to provide a typical of the Treat onsite wastewater (prior to receive required removal efficiency ≥ (%) If discharging to domestic sewage treat wastewater removal efficiency of ≥ (%) Organisation measures to prevent/limit Do not apply industrial sludge to natural reclaimed [OMS3]. Conditions and measures related to measure the testimated substance removal from was (%) Total efficiency of removal from wastewatement plant) RMMs (%) Maximum allowable site tonnage (M _{Saf}	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR14]. No wastewater [TCR14]. No wastewater discharge) to provide the strength of the st	sions and releases to revent discharge of water treatment 0 0 0 ated, contained or	
Risk from environmental exposure is d undissolved substance to or recover from required [TCR6]. Treat air emission to provide a typical of the Treat onsite wastewater (prior to receivate required removal efficiency ≥ (%) If discharging to domestic sewage treat wastewater removal efficiency of ≥ (%) Organisation measures to prevent/limit Do not apply industrial sludge to natural reclaimed [OMS3]. Conditions and measures related to measure the Treatment glant (%) Total efficiency of removal from wastewater treatment plant) RMMs (%) Maximum allowable site tonnage (Msafwastewater treatment removal (kg/d).	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR14]. No wastewater [TCR14]. No wastewater discharge) to provide the strength of the st	sions and releases to revent discharge of water treatment 0 0 0 ated, contained or 97.1 97.1 5.0e6	
soil Risk from environmental exposure is d undissolved substance to or recover frequired [TCR6]. Treat air emission to provide a typical required removal efficiency ≥ (%) If discharging to domestic sewage trea wastewater removal efficiency of ≥ (%) Organisation measures to prevent/limit Do not apply industrial sludge to natura reclaimed [OMS3]. Conditions and measures related to me Estimated substance removal from was (%) Total efficiency of removal from wastev treatment plant) RMMs (%) Maximum allowable site tonnage (Msafe	riven by freshwater sediment [TCR1b]. Prom onsite wastewater [TCR14]. No wastewater [TCR14]. No wastewater [TCR14]. No wastewater discharge) to provide the strength of the st	sions and releases to revent discharge of water treatment 0 0 0 ated, contained or 97.1	

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations. [ETW3]

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1]

Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID section 13 – "LocalCSR" worksheet.

Section 3 Exposure Estimation

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

Section 4 Guidance to check compliance with the Exposure Scenario

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.

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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in factsheet for ESVOC 4.9.v1.

Exposure Estimation:

Human Health

See Appendix A.

Environment

1.7 Use as a Fuel - Professional

1.7.1 Exposure Scenario

	1.7.1 Exposure Scenario			
Section 1 Exposure Scenario Title				
Title				
Use as a Fuel – Professional				
Use Descriptor				
Sector(s) of Use		22		
Process Categories		1, 2, 3, 8a, 8b, 16		
Environmental Release Categories		9a, 9b		
Specific Environmental Release Category		Specific Environmental Release Category		
Processes, tasks, activities covered				
		ve components) and includes activities associated		
with its transfer, use, equipment maint Assessment Method	enance and na	andling of waste.		
See Section 3. Section 2	Operational conditions and risk management measures			
Section 2.1	Control of	worker exposure		
Product characteristics	1,	10/D 1077 10 057		
Physical form of product		ur pressure >10KPa at STP [OC5]		
Concentration of substance in		rentage substance in the product up to 100%		
product Amounts used	No Limit	ed stated differently) [G13]		
		v evineeuree up to 9 hours (upless stated) [C2]		
Frequency and duration of use	1	v exposures up to 8 hours (unless stated) [G2]		
Other Operational Conditions affecting worker exposure	Assumes us	se at not > 20oC above ambient [G15]		
		good basic standard of occupational hygiene has nented [G1]		
Risk Management Measures				
Bulk transfers[CS14] PROC8b	No specific measures identified[EI18]			
Drum/batch transfers [CS8] PROC8b	No specific measures identified[EI18]			
General exposures (closed systems) [CS15]Use in contained batch processes [CS37] PROC1	No specific measures identified[El18]			
General exposures (closed systems) [CS15]Use in contained batch processes [CS37] PROC2	No specific measures identified[EI18]			
General exposures (closed systems) [CS15]Use in contained batch processes [CS37] PROC3	No specific measures identified[EI18]			
General exposures (closed systems) [CS15] PROC1	No specific measures identified[EI18]			
General exposures (closed systems) [CS15] PROC2	No specific measures identified[EI18]			
General exposures (closed systems) [CS15](closed systems)[CS107] PROC16	No specific measures identified[EI18]			
General exposures (closed systems) [CS15](closed systems)[CS107] PROC3	No specific measures identified[EI18]			
Equipment cleaning and maintenance[CS39] PROC8a	No specific	measures identified[El18]		

Vessel and container cleaning[CS103] PROC8a	No specific measures identified[EI18]		
Material storage[CS67] PROC1	No specific measures identified[EI18]		
Material storage[CS67] PROC2 No specific measures identified[EI18]			
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in			
Appendices 1 to 3 Section 2.2 Control of environmental of	exposure		
Product characteristics	•		
	C2].Predominantly hydrophobic [PrC4a].		
Amounts used	32]. redominantly hydrophobic [r ro-a].		
		0.1	
Fraction of EU tonnage used in region			
Regional use tonnage (tonnes/year)		7.0e1	
Fraction of Regional tonnage used loc	ally	5.0e-4	
Annual site tonnage (tonnes/year)		3.5e-2	
Maximum daily site tonnage (kg/day)		9.6e-2	
Frequency and duration of use			
Continuous release [FD2].		Ta a =	
Emission days (days/year)		365	
Environmental factors not influence	ed by risk management		
Local freshwater dilution factor		10	
Local marine water dilution factor		100	
Other given operational conditions	affecting environmental exposure		
Release fraction to air from process (ir	nitial release prior to RMM)	1.0e-2	
Release fraction to wastewater from p	,	0.00001	
Release fraction to soil from process (initial release prior to RMM)		0.00001	
Technical conditions and measures at process level (source) to prevent release			
	. , , .		
Common practices vary across sites the	hus conservative process release estimat	tes used [TCS1].	
Common practices vary across sites the Technical onsite conditions and me		tes used [TCS1].	
Common practices vary across sites the Technical onsite conditions and me releases to soil	hus conservative process release estimate easures to reduce or limit discharges,	tes used [TCS1].	
Common practices vary across sites the Technical onsite conditions and me releases to soil Risk from environmental exposure is contact.	hus conservative process release estimate easures to reduce or limit discharges, a driven by freshwater [TCR1a].	tes used [TCS1].	
Common practices vary across sites the Technical onsite conditions and me releases to soil Risk from environmental exposure is a No wastewater treatment required [TC]	hus conservative process release estimate easures to reduce or limit discharges, a driven by freshwater [TCR1a]. CR6].	res used [TCS1]. air emissions and	
Common practices vary across sites the Technical onsite conditions and me releases to soil Risk from environmental exposure is contact.	hus conservative process release estimate easures to reduce or limit discharges, a driven by freshwater [TCR1a]. CR6]. removal efficiency of (%)	tes used [TCS1].	
Common practices vary across sites the Technical onsite conditions and mereleases to soil Risk from environmental exposure is a No wastewater treatment required [TC] Treat air emission to provide a typical Treat onsite wastewater (prior to receive required removal efficiency ≥ (%)	hus conservative process release estimate easures to reduce or limit discharges, adriven by freshwater [TCR1a]. CR6]. removal efficiency of (%) ving water discharge) to provide the	res used [TCS1]. air emissions and	
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The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

Section 4 Guidance to check compliance with the Exposure Scenario

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 sho

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in factsheet for ESVOC 7.12a.v1.

Exposure Estimation:

Human Health

See Appendix A.

Environment

1.8 Use as a Fuel - Consumer

1.8.1 Exposure Scenario			
Section 1 Exposure Scenario Title			
Title			
Use as a Fuel – Consumer			
Use Descriptor			
Sector(s) of Use		21	
Product Categories		13 Further information on the mapping and allocation of PC codes is contained in Appendix 1.b.	
Environmental Release Categories		9a, 9b	
Specific Environmental Release Category		ESVOC 9.12c.v1	
Processes, tasks, activities covered Covers consumer uses in fuels			
Assessment Method			
See Section 3.			
Section 2		Operational conditions and risk management measures	
Field for additional statements to explain scenario if required - pending better understanding from ECHA			
Section 2.1		Control of consumer exposure	
Product characteristics			
Physical form of product		liquid	
Vapour pressure		300000	
Concentration of substance in product		Unless otherwise stated, cover concentrations up to 100% [ConsOC1]	
Amounts used		Unless otherwise stated, covers use amounts up to37500g [ConsOC2]; covers skin contact area up to 420cm2 [ConsOC5]	
Frequency and duration of use/exposure		Unless otherwise stated, covers use frequency up to 0.143 times per day [ConsOC4]; covers exposure up to 2 hours per event [ConsOC14]	
Other Operational Conditions affecting exposure		Unless otherwise stated assumes use at ambient temperatures [ConsOC15]; assumes use in a 20 m ³ room [ConsOC11]; assumes use with typical ventilation [ConsOC8].	
Section 2.1.1		Product categories	
PC13:FuelsLiquid - subcategories added: Automotive Refuelling	oc	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 52 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 37500g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m3[ConsOC11]; for each use event, covers exposure up to 0.05hr/event[ConsOC14];	
	RMM	No specific RMMs developed beyond those OCs stated	
PC13:FuelsLiquid - subcategories added: Scooter Refuelling	OC	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 52 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 3750g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m3[ConsOC11]; for each use event, covers exposure up to 0.03hr/event[ConsOC14];	
	RMM	No specific RMMs developed beyond those OCs	

		stated		
PC13:FuelsLiquid - subcategories added: Garden Equipment - Use	OC	Unless otherwise stated, covers 100% [ConsOC1]; covers use use use use [ConsOC3]; covers use of use[ConsOC4]; for each use amounts up to 750g [ConsOC2 [ConsOC12]; covers use in room 100m3[ConsOC11]; for each use exposure up to 2.00hr/event[Consocific RMMs developed by the statement of the state	up to 26 se up to 1 time/on day event, covers use]; covers outdoor use m size of se event, covers onsOC14];	
	IXIVIIVI	stated	eyona mose ocs	
PC13:FuelsLiquid (subcategories added): Garden Equipment - Refueling	oc	Unless otherwise stated, covers 100% [ConsOC1]; covers use a days/year[ConsOC3]; covers use of use[ConsOC4]; covers skin of 420.00 cm2 [ConsOC5]; for each use amounts up to 750g [Constone car garage (34m3) under ty [ConsOC10]; covers use in room 34m3[ConsOC11]; for each use exposure up to 0.03hr/event[ConsOC10]	up to 26 se up to 1 time/on day contact area up to ch use event, covers OC2]; Covers use in a pricial ventilation m size of e event, covers onsOC14];	
	RMM	No specific RMMs developed b stated	eyond those OCs	
PC13:FuelsLiquid (subcategories added): Home space heater fuel	OC	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 3000g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.03hr/event[ConsOC14];		
	RMM	No specific RMMs developed b	eyond those OCs	
PC13:FuelsLiquid - subcategories added: Lamp oil	OC	stated Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 52 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 100g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.01hr/event[ConsOC14];		
	RMM	No specific RMMs developed b stated	eyond those OCs	
Additional information on the basis for t Appendices 1 to 3 Section 2.2 Control of environmental e			/IMs is contained in	
Product characteristics	Aposuie			
Substance is isomeric mixture [PrC	21 Predo	minantly hydronhobic [DrC4e]		
Fraction of EU tonnage used in region	_j.i ieu0	mmanuy nyuruphubic [FTO4a].	5.0e-4	
Regional use tonnage (tonnes/year)			2.1e4	
Fraction of Regional tonnage used locally		0.0005		
Annual site tonnage (tonnes/year)		1.0e1		
Maximum daily site tonnage (kg/day)		2.9e1		
Frequency and duration of use				
Continuous release [FD2].				
Emission days (days/year)			365	
Environmental factors not influence	d by risk	management		
Local freshwater dilution factor			10	

Local marine water dilution factor	100		
Other given operational conditions affecting environmental exposure	•		
	_		
Release fraction to air from process (initial release prior to RMM)	1.0e-2		
Release fraction to wastewater from process (initial release prior to RMM)	0.00001		
Release fraction to soil from process (initial release prior to RMM)	0.00001		
Conditions and measures related to municipal sewage treatment plant			
Estimated substance removal from wastewater via domestic sewage treatment (%)	97.1		
Maximum allowable site tonnage (M _{Safe}) based on release following total wastewater treatment removal (kg/d).	2.4e6		
Assumed domestic sewage treatment plant flow (m³/d)	2000		
Conditions and measures related to external treatment of waste for disposal			

Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2]. External treatment and disposal of waste should comply with applicable local and/or national regulations. [ETW3]

Conditions and measures related to external recovery of waste

This substance is consumed during use and no waste of the substance is generated. [ERW3]

Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID section 13 – "LocalCSR" worksheet.

Section 3 Exposure Estimation

3.1. Health

The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC Report #107 and the Chapter R15 of the IR&CSA TGD. Where exposure determinants differ to these sources, then they are indicated.

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

Section 4 Guidance to check compliance with the Exposure Scenario

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.

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 [DSU1].

Exposure Estimation:

Human Health

See Appendix A.

Environment

1.9 Use as Functional Fluids - Industrial

1.9.1 Exposure Scenario

1.9.1 Exposure Scenario	
Section 1 Exposure Scenario Title Title	
Use as Functional Fluids – Industrial	
Use Descriptor	
·	3
Sector(s) of Use	
Process Categories	1, 2, 4, 8a, 8b, 9 Further information on the mapping and allocation of PROC codes is contained in Appendix 1.a.
Environmental Release Categories	7
Specific Environmental Release Category	ESVOC 7.13a.v1
Processes, tasks, activities covered Use as functional fluids e.g. cable oils, transfer industrial equipment including maintenance an Assessment Method	oils, coolants, insulators, refrigerants, hydraulic fluids in d related material transfers
See Section 3.	
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure >10KPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
Risk Management Measures	
Bulk transfers[CS14](closed systems)[CS107] PROC1	No specific measures identified[EI18]
Bulk transfers[CS14](closed systems)[CS107] PROC2	No specific measures identified[El18]
Drum/batch transfers [CS8] PROC8b	No specific measures identified[EI18]
Filling of articles/equipment[CS84](closed systems)[CS107] PROC9	No specific measures identified[El18]
Filling / preparation of equipment from drums or containers.[CS45] PROC8a	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC2	No specific measures identified[EI18]
General exposures (open systems) [CS16] PROC4	No specific measures identified[EI18]
General exposures (open systems) [CS16]Operation is carried out at elevated temperature (> then 20°C above ambient temperature)[OC7] PROC4	No specific measures identified[EI18]
General exposures (open systems) [CS16]Operation is carried out at elevated temperature (> then 20°C above ambient temperature)[OC7] PROC4	No specific measures identified[El18]

Remanufacture of reject articles[CS19] PROC9	No specific measures identified[EI18]			
11009					
Equipment maintenance [CS5] PROC8a	No specific measures identified[FI181			
Equipment maintenance [000] i Nooda	Two specific measures facilities				
Material storage[CS67] PROC1	No specific measures identified[EI18]			
Material storage[CS67] PROC2	No specific measures identified	-			
Additional information on the basis for the alloc	l	MMs is contained in			
Appendices 1 to 3					
Section 2.2 Control of environmental exposure					
Product characteristics					
Substance is isomeric mixture [PrC2].Predo	ominantly hydrophobic [PrC4a].				
Amounts used					
Fraction of EU tonnage used in region		0.1			
Regional use tonnage (tonnes/year)		4.6e1			
Fraction of Regional tonnage used locally		2.2e-1			
Annual site tonnage (tonnes/year)		1.0e1			
Maximum daily site tonnage (kg/day)		5.0e2			
Frequency and duration of use					
Continuous release [FD2].		loo			
Emission days (days/year) Environmental factors not influenced by risk ma	pnagomont	20			
-	anagement	140			
Local freshwater dilution factor Local marine water dilution factor		10			
Other given operational conditions affecting env	vironmental exposure	100			
Carlot given operational container arreating on	Vironimental expedite				
Release fraction to air from process (initial release	Release fraction to air from process (initial release prior to RMM) 1.0e-2				
Release fraction to wastewater from process (in	3.0e-5				
Release fraction to soil from process (initial release prior to RMM) 0.001					
Technical conditions and measures at process	level (source) to prevent release				
Common practices vary across sites thus conse	ervative process release estimate	s used [TCS1].			
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to					
Risk from environmental exposure is driven by	freshwater ITCR1al Prevent disc	harge of undissolved			
substance to or recover from onsite wastewater	r [TCR14]. No wastewater treatme	ent required [TCR6].			
Treat air emission to provide a typical removal		0			
Treat onsite wastewater (prior to receiving waterequired removal efficiency ≥ (%)	0				
If discharging to domestic sewage treatment plant, provide the required onsite 0					
wastewater removal efficiency of ≥ (%)					
Organisation measures to prevent/limit release					
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or					
reclaimed [OMS3]. Conditions and measures related to municipal sewage treatment plant					
Estimated substance removal from wastewater	97.1				
(%) Total efficiency of removal from wastewater after	or anaita and affaita (damaatia	07.1			
treatment plant) RMMs (%)	97.1				
Maximum allowable site tonnage (M _{Safe}) based	5.0e6				
wastewater treatment removal (kg/d).	2000				
Assumed domestic sewage treatment plant flow (m3/d) 2000					
Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national					
regulations. [ETW3]					
Conditions and measures related to external recovery of waste					
External recovery and recycling of waste should comply with applicable local and/or national					
regulations. [ERW1]					

Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID section 13 – "LocalCSR" worksheet.

Section 3 Exposure Estimation

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

Section 4 Guidance to check compliance with the Exposure Scenario

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.

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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in factsheet for ESVOC 7.13a.v1.

Exposure Estimation:

Human Health

See Appendix A.

Environment

1.10 Use as Functional Fluids - Professional

1 10 1 Exposure Scenario

1.10.1 Exposure Scenario			
Section 1 Exposure Scenario Title Title			
Use as Functional Fluids – Professional			
Use Descriptor	laa		
Sector(s) of Use	22		
Process Categories	1, 2, 3, 8a, 9, 20		
	Further information on the mapping and allocation of PROC codes is contained in Appendix 1.a.		
Environmental Release Categories	9a, 9b		
Specific Environmental Release Category			
Processes, tasks, activities covered	<u>′ </u>		
	ansfer oils, insulators, refrigerants, hydraulic fluids in		
professional equipment including mainter			
Assessment Method			
See Section 3.			
Section 2	Operational conditions and risk management measures		
Section 2.1	Control of worker exposure		
Product characteristics			
Physical form of product	Liquid, vapour pressure >10KPa at STP [OC5]		
Concentration of substance in product	Covers percentage substance in the product up to 100%		
•	(unless stated stated differently) [G13]		
Amounts used	No Limit		
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]		
Other Operational Conditions affecting	Assumes use at not > 20oC above ambient [G15]		
worker exposure			
	Assumes a good basic standard of occupational hygiene has been implemented [G1]		
Risk Management Measures	nas been implemented [O1]		
Drum/batch transfers [CS8] PROC8a	No specific measures identified[EI18]		
Drum/baten transfers [COO] i NOCOa	No specific measures identified[E110]		
Transfer from/pouring from containers	No specific measures identified[EI18]		
[CS22] PROC9			
Filling / preparation of equipment from	No specific measures identified[EI18]		
drums or containers.[CS45] PROC9	No specific measures identified[E118]		
General exposures (closed systems)	No specific measures identified[EI18]		
[CS15] PROC1	No specific measures identified[EI18]		
General exposures (closed systems)	No specific measures identified[EI18]		
[CS15] PROC2	No specific measures identified[Li fo]		
	No appoint managers identified[F140]		
General exposures (closed systems) [CS15] PROC3	No specific measures identified[EI18]		
•	N		
General exposures (open systems) [CS16] PROC20	No specific measures identified[EI18]		
General exposures (open systems) [CS16]Operation is carried out at	No specific measures identified[EI18]		
elevated temperature (> then 20°C			
above ambient temperature)[OC7]			
PROC20			
Remanufacture of reject articles[CS19]	No specific measures identified[El18]		
PROC9			

Equipment maintenance [CS5] PROC8a	No specific measures identified[EI18]			
Material storage[CS67] PROC1	No specific measures identified[EI18]			
Material storage[CS67] PROC2	No specific measures identified[EI18]			
*				
Additional information on the basis for the Appendices 1 to 3		AIMs is contained in		
Section 2.2 Control of environmental exp	osure			
Product characteristics				
Substance is isomeric mixture [PrC2]	.Predominantly hydrophobic [PrC4a].			
Amounts used				
Fraction of EU tonnage used in region		0.1		
Regional use tonnage (tonnes/year)		2.3e1		
Fraction of Regional tonnage used locally	1	5.0e-4		
Annual site tonnage (tonnes/year)		1.1e-2		
Maximum daily site tonnage (kg/day)		3.1e-2		
Frequency and duration of use				
Continuous release [FD2].				
Emission days (days/year)		365		
Environmental factors not influenced by r	isk management	L		
Local freshwater dilution factor		10		
Local marine water dilution factor		100		
Other given operational conditions affecti	ng environmental exposure	L		
		T		
Release fraction to air from process (initia		0.05		
Release fraction to wastewater from proc		0.025		
Release fraction to soil from process (initial release prior to RMM) 0.025				
Technical conditions and measures at pro				
Common practices vary across sites thus				
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil				
Risk from environmental exposure is drive	en by freshwater [TCR1a].			
No wastewater treatment required [TCR6		Taura		
Treat air emission to provide a typical rem		N/A		
Treat onsite wastewater (prior to receiving required removal efficiency ≥ (%)	0			
If discharging to domestic sewage treatment plant, provide the required onsite 0				
wastewater removal efficiency of ≥ (%)				
Organisation measures to prevent/limit release from site				
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or				
reclaimed [OMS3]. Conditions and measures related to municipal sewage treatment plant				
Estimated substance removal from waste		97.1		
(%)	•			
Total efficiency of removal from wastewater after onsite and offsite (domestic		97.1		
treatment plant) RMMs (%) Maximum allowable site tonnage (M _{Safe}) based on release following total		2.1e3		
wastewater treatment removal (kg/d).		2.100		
Assumed domestic sewage treatment plant flow (m3/d)		2000		
Conditions and measures related to external treatment of waste for disposal				
External treatment and disposal of waste should comply with applicable local and/or national				
regulations. [ETW3] Conditions and measures related to external recovery of waste				
External recovery and recycling of waste should comply with applicable local and/or national				
regulations. [ERW1]				
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in				
Petrorisk file in IUCLID section 13 – "LocalCSR" worksheet.				
Section 3 Exposure Estimation				

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

Section 4 Guidance to check compliance with the Exposure Scenario

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.

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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in factsheet for ESVOC 9.13b.v1.

Exposure Estimation:

Human Health

See Appendix A.

Environment

1.11 Other Consumer Uses - Consumer

1.11.1 Exposure Scenario

1.11.1 Exposure Scenario				
Section 1 Exposure Scenario Title				
Title				
Other Consumer Uses – Consu	ımer			
Use Descriptor Sector(s) of Use		21		
Product Categories		28, 39		
Froduct Categories		26, 39		
Environmental Release Catego	ories	8a, 8d		
Specific Environmental Release		ESVOC 8.16.v1		
Processes, tasks, activities cov		<u>l</u>		
	consumer examples nces. Note: For cosmo	etic and personal care produ		
See Section 3.				
Section 2 Operational conditional	tions and risk manage	gement measures		
Section 2.1 Control of consu				
Product characteristics				
Physical form of product		sure >10KPa at STP [OC5]		
Vapour pressure (kPa)	>10			
Concentration of substance in		substance in the product up	to 100% (unless stated stated	
product	differently) [G13]			
Frequency and duration of use/exposure				
Other Operational Conditions				
affecting exposure				
Product Category		agement Measures and Ope		
	required controls to	o demonstrate safe use lis	ted)	
Conoral magazinas (darmal	Not applicable			
General measures (dermal irritants)	Not applicable			
General measures	Not applicable			
(carcinogens)	' '			
PC28	Not applicable	Not applicable		
PC39	Not applicable			
Section 2.2 Control of enviro	nmental evnosure			
Product characteristics	mineritai exposure			
Substance is isomeric mixtu	re [PrC2] Predomina	antly hydrophobic [PrC4a]		
Amounts used		and, my arephresis [i i e iaj.		
Fraction of EU tonnage used in	region		0.1	
			1.0e1	
	Fraction of Regional tonnage used locally 0.0005			
			5.0e-3	
Maximum daily site tonnage (kg/day) 1.4e-2				
Frequency and duration of use				
·				
Continuous release [FD2].				
Emission days (days/year) 365				
Environmental factors not influenced by risk management				
Local freshwater dilution factor 10				
Local marine water dilution factor 100				
Other given operational conditions affecting environmental exposure				
Release fraction to air from process (initial release prior to RMM) 0.95				
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1				

Release fraction to wastewater from process (initial release prior to RMM)	0.025
Release fraction to soil from process (initial release prior to RMM)	0.025
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	97.1.0
Maximum allowable site tonnage (M _{Safe}) based on release following total wastewater treatment removal (kg/d).	1.1e3
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and magazines related to external treatment of wests for disposal	·

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations. [ETW3]

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1] Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID section 13 – "LocalCSR" worksheet.

Section 3 Exposure Estimation

3.1. Health

The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC Report #107 and the Chapter R15 of the IR&CSA TGD. Where exposure determinants differ to these sources, then they are indicated.

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

Section 4 Guidance to check compliance with the Exposure Scenario

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.

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 [DSU1].

Exposure Estimation:

Human Health

See Appendix 2.b.

Environment

1.12 Use in Laboratories - Industrial

1.12.1 Exposure Scenario

1.12.1 Exposure Scenario				
Section 1 Exposure Scenario Title				
Title				
Use in Laboratories – Industrial				
Use Descriptor		To.		
Sector(s) of Use		3		
Process Categories		10, 15 Further information on the mapping and allocation of PROC codes is contained in Appendix 1.a.		
Environmental Release Categories		2, 4		
Specific Environmental Release Categor	У	Not Applicable		
Processes, tasks, activities covered				
Use of the substance within laboratory so	ettings, inclu	iding material transfers	and equipment cleaning	
Assessment Method				
See Section 3.				
Section 2	_		k management measures	
Section 2.1	Control o	f worker exposure		
Product characteristics				
Physical form of product		oour pressure >10KPa		
Concentration of substance in product	(unless sta	Covers percentage substance in the product up to 100% (unless stated stated differently) [G13]		
Amounts used	No Limit			
Frequency and duration of use		• •	ours (unless stated) [G2]	
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]			
	Assumes a good basic standard of occupational hygiene has been implemented [G1]			
Risk Management Measures				
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]			
Cleaning[CS47] PROC10	No specific measures identified[EI18]			
Additional information on the basis for th Appendices 1 to 3	e allocation	of the identified OCs a	nd RMMs is contained in	
Section 2.2 Control of environmental ex	posure			
Product characteristics				
Substance is isomeric mixture [PrC2	1.Predomina	antly hydrophobic [PrC4	4a1.	
Amounts used	<u>-</u>	, , , ,	•	
Fraction of EU tonnage used in region		0.1		
Regional use tonnage (tonnes/year)			5.0e0	
Fraction of Regional tonnage used locall	V		4.0e-1	
Annual site tonnage (tonnes/year)	,		2.0e0	
Maximum daily site tonnage (kg/day)			1.0e2	
Frequency and duration of use			1.002	
Continuous release [FD2].				
Emission days (days/year)		20		
Environmental factors not influenced by	risk manage	ment		
Local freshwater dilution factor	- 3		10	
Local marine water dilution factor		100		
Other given operational conditions affect	ing environr	nental exposure	L	
Delegas fraction to six from process (initial	al ralessa :	rior to DMM)	0.005	
Release fraction to air from process (initi	ai reiease p	HOLIO KIVIIVI)	0.025	

Release fraction to wastewater from process (initial release prior to RMM)	0.02			
Release fraction to soil from process (initial release prior to RMM)	0.0001			
Technical conditions and measures at process level (source) to prevent release	1			
Common practices vary across sites thus conservative process release estimate	es used [TCS1].			
Technical onsite conditions and measures to reduce or limit discharges, air emis				
soil				
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. No wastewater treatment required [TCR6].				
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 ≥ (%)	0			
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	0			
Organisation measures to prevent/limit release from site				
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be inciner reclaimed [OMS3].	ated, contained or			
Conditions and measures related to municipal sewage treatment plant				
Estimated substance removal from wastewater via domestic sewage treatment (%)	97.1			
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97.1			
Maximum allowable site tonnage (M _{Safe}) based on release following total wastewater treatment removal (kg/d).	7.5e3			
Assumed domestic sewage treatment plant flow (m3/d)	2000			
Conditions and measures related to external treatment of waste for disposal				
External treatment and disposal of waste should comply with applicable local and/or national regulations. [ETW3]				
Conditions and measures related to external recovery of waste				
External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1]				
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID section 13 – "LocalCSR" worksheet.				
Section 3 Exposure Estimation				
3.1. Health				
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.				
3.2. Environment				
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].				
Section 4 Guidance to check compliance with the Exposure Scenario				
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. 4.2. Environment				
	lo to all aitear three			

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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3].

Exposure Estimation:

Human Health

See Appendix A.

Environment

1.13 Use in Laboratories - Professional

1.13.1 Exposure Scenario

1.13.1 Exposure Scenario							
Section 1 Exposure Scenario Title							
Title							
Use in Laboratories – Professional							
Use Descriptor		loo					
Sector(s) of Use		22					
Process Categories			rmation on the mapping and allocation odes is contained in Appendix 1.a.				
Environmental Release Categories		8a					
Specific Environmental Release Category	ory	ESVOC 8.17.v1					
Processes, tasks, activities covered							
Use of the substance within laboratory	settings, inclu	uding material transfers a	and equipment cleaning				
Assessment Method							
See Section 3.							
Section 2	-	l conditions and risk m	nanagement measures				
Section 2.1	Control of	worker exposure					
Product characteristics							
Physical form of product		our pressure >10KPa at	• •				
Concentration of substance in		centage substance in the					
product Amounts used	No Limit	ed stated differently) [G1	[3]				
Frequency and duration of use		exposures up to 8 hour	rs (unloss stated) [G2]				
Other Operational Conditions							
affecting worker exposure	Assumes use at not > 20oC above ambient [G15]						
		good basic standard of on the standard of one content of the standard of the s	occupational hygiene has				
Risk Management Measures							
Laboratory activities [CS36] PROC15	No specific	measures identified[EI18	3]				
Cleaning[CS47] PROC10	No specific	measures identified[EI18	3]				
Additional information on the basis for Appendices 1 to 3	the allocation	of the identified OCs and	d RMMs is contained in				
Section 2.2 Control of environmental e	exposure						
Product characteristics							
Substance is isomeric mixture [PrC	2].Predomina	antly hydrophobic [PrC4a	a].				
Amounts used							
Fraction of EU tonnage used in region			0.1				
Regional use tonnage (tonnes/year)			5.0e-1				
Fraction of Regional tonnage used loca	ally		5.0e-4				
Annual site tonnage (tonnes/year)			2.5e-4				
Maximum daily site tonnage (kg/day)			6.9e-4				
Frequency and duration of use							
Continuous release [FD2].							
Emission days (days/year)			365				
Environmental factors not influenced by	y risk manage	ement	I				
Local freshwater dilution factor			10				
Local marine water dilution factor			100				
Other given operational conditions affe	cting environr	mental exposure	1				
Release fraction to air from process (in	itial release n	rior to RMM)	0.5				
		',					

Release fraction to wastewater from process (initial release prior to RMM)	0.5
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates	s used [TCS1].
Technical onsite conditions and measures to reduce or limit discharges, air emiss	sions and releases to
soil	
Risk from environmental exposure is driven by freshwater [TCR1a]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the	0
required removal efficiency ≥ (%)	
If discharging to domestic sewage treatment plant, provide the required onsite	0
wastewater removal efficiency of ≥ (%)	
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incineral reclaimed [OMS3].	ated, contained or
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	97.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97.1
Maximum allowable site tonnage (M _{Safe}) based on release following total wastewater treatment removal (kg/d).	5.6e1
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and regulations. [ETW3]	d/or national
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and regulations. [ERW1]	l/or national
Additional information on the basis for the allocation of the identified OCs and RN Petrorisk file in IUCLID section 13 – "LocalCSR" worksheet.	//Ms is contained in
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless of	otherwise indicated.
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposmodel [EE2].	sure with the Petrorisk
Section 4 Guidance to check compliance with the Exposure Scenario	

lidance to check compliance with the Exposure Scenari

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.

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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in factsheet for ESVOC 8.17.v1.

Exposure Estimation:

Human Health

See Appendix A.

Environment

See PETRORISK file (Annex III).

1.14 Regional Environment Exposure Estimation

See PETRORISK file (Annex III).

1.15 Qualitative Risk Assessments

The purpose of the qualitative risk characterisation is to assess:

".the likelihood that effects are avoided when implementing the exposure scenario..." (REACH Annex 1, Section 6.5).

This qualitative CSA approach aims to reduce/avoid contact when there is no basis for setting a DNEL or DMEL for a certain human health endpoint, i.e. when the available data for this effect do not provide quantitative dose-response information, but there exist toxicity data of a qualitative nature. The endpoints for which the available data may trigger a qualitative risk characterisation includes aspiration hazard (R65) and defatting of the skin (R66).

1.15.1 Aspiration Hazard Assessment (R65)

'Aspiration' means the entry of a liquid substance directly into the trachea and lower respiratory tract. Aspiration of hydrocarbon substances can result in severe acute effects such as chemical pneumonitis, varying degrees of pulmonary injury or death. This property relates to the potential for low viscosity material to spread quickly into the deep lung and cause severe pulmonary tissue damage. Classification of a hydrocarbon substance for aspiration hazard is made on the basis of reliable human evidence or on the basis of physical properties.

The R65 risk phrase (Harmful: may cause lung damage if swallowed) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. This general qualitative CSA approach aims to reduce/avoid contact or incidents with the substance. However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance. Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern.

There are no routine anticipated exposures by ingestion related to any supported uses of the substance. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific risk. For any substance, classified as R65, these measures should be communicated via the safety data sheet by use of the following phrase:

• Do not ingest. If swallowed then seek immediate medical assistance.

Furthermore it should be noted that where the substance is sold for use in lamp oils and grill lighters by the general public (Consumers), then these must be visibly, legibly and indelibly marked as follows, in accordance with REACH Annex XVII update of 1.4.2010:

- Keep lamps filled with this liquid out of the reach of children.
- Just a sip of lamp oil or even sucking the wick of lamps may lead to life threatening lung damage.

1.15.2 Skin Defatting Hazard Assessment (R66)

For substances and preparations that do not meet the criteria for R38 but which may cause concern as a result of skin dryness, flaking or cracking, the risk phrase R66 (Repeated exposure may cause skin dryness or cracking) shall be used. Decisions for applying this phrase are derived either from practical observation after normal handling and use or from other relevant information used to predict effects on the skin.

The R66 risk phrase is generally applied to petroleum substances and solvents that have the capacity to extract lipids from the skin and that are not classified as skin irritant. R66 does not relate to a classifiable endpoint, and there is no standardized test method to quantify the effect. Thus, a DNEL cannot be derived.

Note that R66 is an "additional" risk phrase which means that it shall be applied only to substances or preparations that are already classified whilst assignment of the risk phrase R66 does not, in itself, have any impact on the formal classification of the substance.

This general qualitative CSA approach aims to reduce/avoid contact or incidents with the substance. However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance. Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern

For skin defatting a qualitative risk characterisation has been conducted. Handling and storage risk management measures that are generally identified for skin defatting risks are outlined in Appendix 3.b. A review of these RMMs indicates that if the user complies with the following generic statement, risks due to skin defatting are considered to be controlled. For any substance, classified as R66, these measures should be communicated via the safety data sheet by use of the following phrase:

• PPE20: If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to EN374 and provide employee skin care programmes

2 RISK CHARACTERISATION

2.1 Manufacture of Substance - Industrial

2.1.1 Human Health

See Appendix A.

2.1.2 Environment

See PETRORISK file (Annex III).

2.2 Distribution of Substance - Industrial

2.2.1 Human Health

See Appendix A.

2.2.2 Environment

See PETRORISK file (Annex III).

2.3 Formulation & (Re)packing of Substances and Mixtures – Industrial

2.3.1 Human Health

See Appendix A.

2.3.2 Environment

See PETRORISK file (Annex III).

2.4 Uses in Coatings - Industrial

2.4.1 Human Health

See Appendix A.

2.4.2 Environment

See PETRORISK file (Annex III).

2.5 Uses in Cleaning – Industrial

2.5.1 Human Health

See Appendix A.

2.5.2 Environment

See PETRORISK file (Annex III).

2.6 Use in Blowing Agents – Industrial

2.6.1 Human Health

See Appendix A.

2.6.2 Environment

See PETRORISK file (Annex III).

2.7 Use in Fuels - Professional

2.7.1 Human Health

See Appendix A.

2.7.2 Environment

See PETRORISK file (Annex III).

2.8 Use in Fuels - Consumer

2.8.1 Human Health

See Appendix A.

2.8.2 Environment

See PETRORISK file (Annex III).

2.9 Use in Functional Fluids – Industrial

2.9.1 Human Health

See Appendix A.

2.9.2 Environment

See PETRORISK file (Annex III).

2.10 Use in Functional Fluids - Professional

2.10.1 Human Health

See Appendix A.

10.10.2 Environment

See PETRORISK file (Annex III).

2.11 Use in Other Consumer Uses - Consumer

2.11.1 Human Health

See Appendix A.

2.11.2 Environment

See PETRORISK file (Annex III).

2.11 Use in Laboratories – Industrial

2.11.1 Human Health

See Appendix A.

2.11.2 Environment

See PETRORISK file (Annex III).

2.13 Use in Laboratories - Professional

10.13.1 Human Health

See Appendix A.

2.13.2 Environment

See PETRORISK file (Annex III).

215 Overall exposure (combined for all relevant emission/release sources)

2.15.1 Human health (combined for all exposure routes)

Combined exposures can be calculated with information provided on the individual exposure scenarios presented in section 9. However, it is unclear how to define risk management measures resulting from this analysis.

2.15.2 Environment (combined for all exposure routes)

Combined exposures can be calculated with information provided on the individual exposure scenarios presented in section 9. However, it is unclear how to define risk management measures resulting from this analysis.

2.16 Regional Environment

See PETRORISK file

2.17 Qualitative Risk Assessments

2.17.1 Aspiration Hazard Assessment

The implementation of relevant RMMs will ensure that the likelihood of an event occurring due to the aspiration hazard of the substance is negligible and the risk is considered to be controlled to a level of

For aspiration hazard a qualitative risk characterisation has been conducted consistent with the considerations and risk management measures identified in the Table below.

Hazard	Material	Risk / Hazard Phrase	Examples of Relevant S Phrases and P Statements	Components of the Qualitative Risk Assessment
Aspiration Toxicity (R65)	• Liquid	R65 / H304	Response: (S2): Keep out of the reach of children (for dangerous products sold to the general public must include this safety phrase) S62: If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label P102: Keep out of reach of children. P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P331: Do NOT induce vomiting. Storage: P405: Store locked up. Disposal: P501 : Dispose of contents/container	 Worker Do not ingest Implementation of basic standards of occupational hygiene Avoid splashes and spills Avoidance of contact with contaminated tools and objects Management/supervision to check that the RMMs in place are being used correctly and OCs followed Training for staff on good practice Good standard of personal hygiene Consumer Do not ingest For lamp oils and grill lighters, follow the provisions of REACH – Annex XVII, including: Marketing in black opaque containers not exceeding 1 litre Labelling with specific safe use instruction

Hazard	Material	Risk / Hazard Phrase	Examples of Relevant S Phrases and P Statements	Components of the Qualitative Risk Assessment
			to in accordance with local/regional/ national/international regulations (to be specified)	

For any substance, classified as R65, these risk management measures should be communicated via the safety data sheet by use of the following phrase:

• Do not ingest. If swallowed then seek immediate medical assistance.

2.17.2 Skin Defatting Hazard Assessment

The implementation of relevant RMMs will ensure that the likelihood of an event occurring due to the substance hazard of skin defatting is negligible and the risk is considered to be controlled to a level of no concern.

For skin defatting a qualitative risk characterisation has been conducted consistent with the considerations and risk management measures identified in the Table below.

Hazard	Material	Risk / Hazard Phrase	Examples of Relevant S Phrases and P Statements	Components of the Qualitative Risk Assessment
Skin defatting (R66)	• Liquid	R66 / EUH066 Repeated exposure may cause skin dryness or cracking	No designated S and P phrases are assigned, though the following phrase may be appropriate: S24 Avoid contact with skin Response: P280: Wear protective gloves/protective gloves/protection/face protection. P281: Use personal protective equipment as required.	 Implementation of basic standards of occupational hygiene; Avoid repeated and/or prolonged skin contact with product; Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination promptly; Avoid splashes and spills; Avoidance of contact with contaminated tools and objects; Clean up contamination/spills; Regular cleaning of equipment and work area; Management/supervision to check that the RMMs in place are being used correctly and OCs followed; Training for staff on good practice to prevent / minimise exposures and to report any skin effects that may develop; Good standard of personal hygiene.

For any substance, classified as R66, these measures should be communicated via the safety data sheet by use of the following phrase:

 PPE20: If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to EN374 and provide employee skin care programmes

APPENDIX A - EXPOSURE USE MAPPING

A1.1.1 Manufacture of Substance - Industrial

Table 1: Mapping Uses in the Supply Chain													
			Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor							
User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent							
Industrial SU8/9/3	General process exposures (no sampling)	CS15	Continuous; daily; 15 - 1 hour; product temp. Outdoor	Closed processes	Closed process. No exposure.	PROC1 Closed process (no sampling)							
Industrial - SU8/9/3	General process exposures and sample collection	CS15	Continuous; daily; 15 mins - 1 hour; product temp. Outdoor	Enclosed process; Outdoor location; closed/semi- closed sampling	With LEV	PROC2 Closed continuous process (with sampling)							
Industrial - SU8/9/3	General process exposures	CS15	Batch process; daily; 15 - 1 hour; product temp.; Indoor/Outdoor	Closed equipment, enclosed or vented sampling points	With LEV	PROC3 Closed batch process (with sampling)							
Industrial - SU8/9/3	General exposures open batch process	CS16	Daily; 15 - 1 hour; product temp.; Indoor/Outdoor	Enclosed transfers, clear lines prior to decoupling	With LEV	PROC4 batch process with exposure							
Industrial - SU8/9/3	Sample collection	CS2	Daily; <15 mins; product temp.; Indoor/Outdoor	Closed or ventilated sampling points	With LEV	PROC8b Dedicated discharging to/from vessels							
Industrial SU8/9/3	Laboratory activities	CS36	Daily; 15 mins - 1 hour; product temp.; Indoor	Fume cupboard. PPE.	With LEV	PROC15 Use in laboratory							
Industrial - SU8/9/3	Bulk transfers (no lev)	CS14, CS108	Daily; 15 - 1 hour; product temp.; Indoor/Outdoor	Enclosed transfers, clear lines prior to decoupling	With LEV	PROC8b Dedicated discharging to/from vessels							
Industrial - SU8/9/3	Open bulk transfers (aerosols)	CS14, CS108	Daily; 15 - 1 hour; product temp.; Indoor/Outdoor	Enclosed transfers, clear lines prior to decoupling	With LEV	PROC8b Dedicated discharging to/from vessels							
Industrial SU8/9/3	Bulk transfers (with lev)	CS14, CS107	Daily; 15 - 1 hour; product temp.; Indoor/Outdoor	Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	PROC8b Dedicated discharging to/from vessels							
Industrial - SU8/9/3	Clean down and Maintenance	CS39	Daily; 15 mins -1 hour; product temp; collection of line waste in container;	Enclosed lines; retain wash down in sealed storage pending disposal or use as	No LEV	PROC8a Non- dedicated discharging to/from vessels							
Industrial: - SU3/ SU10	Storage	CS67	Daily; 8 hrs; product temp;	samples collected at dedicated sample point	outdoor activity	PROC1 Closed process (no sampling)							
Industrial - SU3/ SU10	Storage	CS67	Daily; 8 hrs; product temp;	samples collected at dedicated sample point	outdoor activity	PROC2 Closed continuous process (with sampling)							
	Industrial SU8/9/3	Industrial: General process exposures (no sampling) Industrial: General process exposures and sample collection Industrial: General process exposures and sample collection Industrial: General process exposures Industrial: General exposures open batch process Industrial: SUB/9/3 exposures Industrial: Sub/9/3 activities Industrial: Bulk transfers (no lev) Industrial: Open bulk transfers (a e rosols) Industrial: SUB/9/3 (with lev) Industrial: SUB/9/3 (carosols) Industrial: SUB/9/3 (carosols) Industrial: SUB/9/3 (storage) Industrial: SUB/9/3 (storage)	Industrial: SUB/9/3 Indust	User Group Contributing Scenarios CS Ref Continuous; daily; 15 - 1 hour; product temp. Outdoor Industrial: General process exposures and sample collection Industrial: General process exposures and sample collection Industrial: General process exposures and sample collection Industrial: General process exposures Exposures CS 15 Batch process; daily; 15 - 1 hour; product temp. Outdoor Industrial: General exposures open batch process open batch process Industrial: Subliking: Sample collection Industrial: Laboratory collection Industrial: Bulk transfers (no CS 14, CS 108 product temp.; Indoor/Outdoor Industrial: Bulk transfers (no CS 14, CS 108 product temp.; Indoor/Outdoor Industrial: Bulk transfers (no CS 14, CS 108 product temp.; Indoor/Outdoor Industrial: Bulk transfers (no CS 14, CS 108 product temp.; Indoor/Outdoor Industrial: Bulk transfers (no CS 14, CS 108 product temp.; Indoor/Outdoor Industrial: Bulk transfers (no CS 14, CS 108 product temp.; Indoor/Outdoor Industrial: Bulk transfers (no CS 14, CS 108 product temp.; Indoor/Outdoor Industrial: Bulk transfers (so CS 14, CS 108 product temp.; Indoor/Outdoor Industrial: Bulk transfers (so CS 14, CS 107 product temp.; Indoor/Outdoor Industrial: SUB/9/3 product temp.; Indoor/Outdoor Industrial: SUB/9/3 Storage CS 67 Daily; 15 mins -1 hour; product temp.; Indoor/Outdoor	User Group Contributing Scenarios CS Ref Conditions Text Text Text Text Conditions Text Conditions Text Conditions Text Conditions Text Conditions Text Conditions CS Ref Continuous; daily; Closed processes sexposures (no sampling) Industrial SUB/9/3 exposures and sample collection Industrial SUB/9/3 exposures Closed Sub/9/3 exposures Collection Collec	Substrial Subs							

A1.1.2 Manufacture of Substance – Industrial

			oing Uses in the	т	able 2: Charact	erising the Ris	sk - High VP Lic	uids - Chemica	al Safety Asse	ssment - Evalu	ation of Safe Us	.е				
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor		Inhalatory exposure		Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	TRA Predicted Exposure (mg/m3) no modifiers	Inhalation RMM (efficiency)	Predicted Inhalation Exposure (mg/m3)	TRA Predicted Dermal Systemic Exposure (mg/kg/d) - no	TRA Predicted Dermal Local Exposure (mg/cm2/d) -	Dermal RMM (efficiency)	Predicted Systemic Dermal Exposure (mg/kg/d)	Predicted Local Dermal Exposure (mg/cm2/d) modified	Con
re of	jroduskladi SUB/S/3	General process exposures (no sampling)	CS 15	Continuous; daily; 15 - 1 hour; product temp. Outdoor	Closed processes	No exposure.	PROC1 Closed process (no sampling)	0.03		0.03	0.34	0.1		0.1	0.1	
	inalushidi Sususas	General process exposures and sample collection	CS 15	product temp. Outdoor	process; Outdoor location; closed/semi- closed/sampling	With LEV	PROC2 Closed continuous process (with sampling)	147.55		147.55	1.37	0.2		0.2	0.2	
	Industrial S149995	General process exposures	CS 15	product temp.; Indoor/Outdoor	Closed equipment, enclosed or vented sampling points	With LEV	PROC3 Closed batch process (with sampling)	296.09		206.56	0.34	0.1		0.1	0.1	
	poustrat Slabbis	General exposures open batch process	CS 16		Enclosed transfers, clear lines prior to decoupling	With LEV	PROC4 batch process with exposure	295.09		206.56	6.96	1		0.2	0.2	
	ibdustriat Sussevs	Sample collection	CS2		Closed or ventilated sampling points	With LEV	PRO C8b Dedicated discharging to/from vessels	442.64		265.58	6.96	1		0.2	0.2	
	bdistrat SURING	Laboratory activities	CS36	hour; product temp.; Indoor	Fume cupboard. PPE.	With LEV	PROC15 Use in laboratory	147.55		147.55	0.34	0.1		0.1	0.1	
	fodustrial SUE/SO	Bulk transfers (no lev)			transfers, clear lines prior to decoupling	With LEV	PRO C8b Dedicated discharging to/from vessels	442.64		13.28	6.86	1		0.02	0.02	
	Industrial - SU8/9/3	Open bulk transfers (ae rosols)	CS 14, CS 108		Enclosed transfers, clear lines prior to decoupling	With LEV	PRO C8b Dedicated discharging to/from vessels	5.00	0	0.00	6.96	1	0	0	0	
	inolosinai Suersos	Bulk transfers (with lev)	CS 14, CS 107	product temp.; Indoor/Outdoor	Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	PRO C8b Dedicated discharging to/from vessels	442.64		13.28	6.86	1	0	0.02	0.02	
	hickestinik SLOOS	Clean down and Maintenance	CS39	hour; product temp; collection of line waste in container:	Enclosed lines; retain wash down in sealed storage pending disposal or use as	No LEV	PROC8a Non- dedicated discharging to/from vessels	737.73		221.32	13.71	1	0	0.2	0.2	
	indestrat SUS SUM	Storage	CS67	product temp;	samples collected at dedicated sample point	outdoor activity	PROC1 Closed process (no sampling)	0.03		0.03	0.34	0.1		0.1	0.1	
	tindustriati - SLIDI SO(8)	Storage	CS67	product temp;	samples collected at dedicated sample point	outdoor activity	PROC2 Closed continuous process (with sampling)	147.55		147.55	1.37	0.2		0.2	0.2	

A1.1.3 Manufacture of Substance – Industrial

			Table 1: Map	ping Uses in the	e Supply Chain	l		Table 2: Characterisin			
				Typical Mapped Operating Conditions	,	pped RMMs	Use Descriptor	Inhalatory exposure			
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	TRA Predicted Exposure (mg/m3) no modifiers	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCF (all routes)
nufacture of estance	Industrial SU8/8/3	General process exposures (no sampling)	CS15	Continuous; daily; 15 - 1 hour; product temp. Outdoor	Closed processes	Closed process. No exposure.	PROC1 Closed process (no sampling)	0.03	0.000	0.001	0.001
	Industrial SUB/9/3	General process exposures and sample collection	CS15	Continuous; daily; 15 mins - 1 hour; product temp. Outdoor		With LEV	PROC2 Closed continuous process (with sampling)	147.55	0.049	0.002	0.051
	Industrial SUB/9/3	General process exposures	CS15	Batch process; daily; 15 - 1 hour, product temp.; Indoor/Outdoor	Closed equipment, enclosed or vented sampling points	With LEV	PROC3 Closed batch process (with sampling)	295.09	0.069	0.001	0.070
	Industrial SUB/8/3	General exposures open batch process	CS16	Daily; 15 - 1 hour; product temp.; Indoor/Outdoor		With LEV	PROC4 batch process with exposure	295.09	0.069	0.002	0.071
	Industrial SUB/9/3	Sample collection	CS2	Daily; <15 mins; product temp.; Indoor/Outdoor	Closed or ventilated sampling points	With LEV	PROC8b Dedicated discharging to/from vessels	442.64	0.089	0.002	0.091
	Industriel SUB/9/3	Laboratory activities	CS36	Daily; 15 mins - 1 hour; product temp.; Indoor	Fume cupboard. PPE.	With LEV	PROC15 Use in laboratory	147.55	0.049	0.001	0.050
	fodustrial SUB/9/3	Bulk transfers (no lev)	CS14, CS108	Daily; 15 - 1 hour; product temp.; Indoor/Outdoor	Enclosed transfers, clear lines prior to decoupling	With LEV	PROC8b Dedicated discharging to/from vessels	442.64	0.004	0.000	0.005
	Industrial - SU8/9/3	Open bulk transfers (aerosols)	CS14, CS108	Daily; 15 - 1 hour; product temp.; Indoor/Outdoor	Enclosed transfers, clear lines prior to decoupling	With LEV	PROC8b Dedicated discharging to/from vessels	5.00	#DIV/0!	0.000	#DIV/0!
	Industrial SUB/9/3	Bulk transfers (with lev)	CS14, CS107	Daily; 15 - 1 hour; product temp.; Indoor/Outdoor	Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	PROC8b Dedicated discharging to/from vessels	442.64	0.004	0.000	0.005
	Industrial SUB/9/3	Clean down and Maintenance	CS39	Daily; 15 mins -1 hour; product temp; collection of line waste in container;	Enclosed lines; retain wash down in sealed storage pending disposal or use as	No LEV	PROC8a Non- dedicated discharging to/from vessels	737.73	0.074	0.002	0.076
	Industrial SUA/ SU10	Storage	CS67	Daily; 8 hrs; product temp;	samples collected at dedicated sample point	outdoor activity	PROC1 Closed process (no sampling)	0.03	0.000	0.001	0.001
	Industrial : SU3/ SU10	Storage	CS67	Daily; 8 hrs; product temp;	samples collected at dedicated sample point	outdoor activity	PROC2 Closed continuous process (with sampling)	147.55	0.049	0.002	0.051

A1.2.1 Distribution of Substance – Industrial

			Table 1: Mapp	ing Uses in the	Supply Chain		
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent
	P0000000000000000000000000000000000000						
Distribution of substance	Industrial - SU3	General process exposures - closed process (e.g. In-line additive dosing	CS15	Continuous; Outdoor; daily; 15 - 1 hour; product temp.	Closed process. No exposure.	Closed process. No exposure.	PROC1 Closed process (no sampling)
Combine in narrative	industrial - SU3	General process exposures (occasional controlled exposure)	CS15	Continuous; Outdoor; daily; 15 mins - 1 hour; product temp.	Enclosed process; closed/semi- closed sampling point	No LEV	PROC2 Closed continuous process (with sampling)
	Industrial - SU3	General process exposures - closed batch process	CS15	Batch process; Outdoor; daily; 15 - 1 hour; product temp.	Closed equipment, enclosed or vented sampling points	No LEV	PROC3 Closed batch process (with sampling)
	Industrial -SU3	General exposures open batch process	CS16	Daily; Indoor/Outdoor; 15 - 1 hour; product temp.	Enclosed transfers, clear lines prior to decoupling	With LEV	PROC4 batch process with exposure
	Industrial - SU3	Sample collection	CS2	Daily; <15 mins; product temp.; Outdoor;	Closed or ventilated sampling points	No LEV	PROC3 Closed batch process (with sampling)
	Industrial - SU3	Laboratory activities	CS36	Daily; 15 mins - 1 hour; product temp.; Indoor	Fume cupboard. PPE.	With LEV	PROC15 Use in laboratory
Combine in narrative as Bulk Transfer CS14 unless differentiation	Industrial - SU3	Bulk closed loading and unloading NEW CS (e.g. road/rail car bottom	CS14, CS107 Bulk transfers (closed systems)	Outdoor; Daily; 15 - 1 hour; product temp.; exposure potential during breaking of hose	Enclosed transfers, clear lines prior to decoupling	No LEV	PROC8b Dedicated Discharging to/from vessels
LEV option	Industrial - SU3	Bulk open loading NEW CS (e.g. road/rail car top loading, may involve LEV)	CS14, CS108 Bulk transfers (open systems)	Outdoor; Daily; 1 - 4 hours; product temp ambient; exposure potential from	Enclosed transfers, submerged loading via tank opening,	With LEV	PROC8b Dedicated discharging to/from vessels
RPE option	Industrial - SU3	Bulk open loading NEW CS (e.g. road/rail car top loading, may involve RPE)	CS14, CS108 Bulk transfers (open systems)	Outdoor; Daily; 1 - 4 hours; product temp ambient; exposure potential from	Enclosed transfers, submerged loading via tank opening,	No LEV	PROC8b Dedicated discharging to/from vessels
	industrial - SU3		CS6	Indoor;	Enclosed transfers, vented transfer points, dedicated filling line	With LEV	PROC9 Transfer of substance/mixtur e into small containers
	Industrial - SU3	Clean down and Maintenance	CS39	Daily; 15 min - 1 hour; product temp; collection of line waste in container	Enclosed lines; retain wash down in sealed storage pending disposal or use as	No LEV	PROC8a Non- dedicated discharging to/from vessels
	Industrial - SU3	Storage	CS67	Daily; 8 hrs; product temp; Outdoors	Samples collected at dedicated sample point	outdoor activity	PROC1 Closed continuous process (sometimes with sampling)
	Industrial - SU3	Storage	CS67	Daily; 8 hrs; product temp; Outdoors	Samples collected at dedicated sample point	outdoor activity	PROC2 Closed continuous process (sometimes with sampling)

A1.2.2 Distribution of Substance – Industrial

			Table 1: Mapp	oing Uses in the	Supply Chair	1		Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use								se
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor		Inhalatory exposure		Demai exposure					
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	TRA Predicted Exposure (mg/m3) no modifiers	Inhalation RMM (efficiency)	Predicted Inhalation Exposure (mg/m3)	TRA Predicted Dermal Systemic Exposure (mg/kg/d) - no	TRA Predicted Dermal Local Exposure (mg/cm2/d) -	Dermal RMM (efficiency)	Predicted Systemic Dermal Exposure (mg/kg/d)	Predicted Local Dermal Exposure (mg/cm2/d) modified	Commer
ibution of tance	Industrial - \$03	General process exposures closed process (e.g. In-line additive dosing	CS 15	Continuous; Outdoor; daily; 15 - 1 hour; product temp.	Closed process. No exposure.	Closed process. No exposure.	PROC1 Closed process (no sampling)	0.03		0.03	0.34	0.1		0.1	0.1	
tive	Industrial - SU3	General process exposures (occasional controlled exposure)	CS 15	Continuous; Outdoor; daily; 15 mins - 1 hour; product temp.	Enclosed process; closed/semi- closed sampling point	No LEV	PROC2 Closed continuous process (with sampling)	147.55		147.55	1.37	0.2		0.2	0.2	
	industriai - Sid3	General process exposures - closed batch process	CS 15	Batch process; Outdoor; daily; 15 - 1 hour; product temp.	Closed equipment, enclosed or vented sampling points	No LEV	PROC3 Closed batch process (with sampling)	295.09		29.51	0.34	0.1		0.01	0.01	
	Industrial: @03	General exposures open batch process	CS 16	Daily; Indoor/Outdoor; 15 - 1 hour; product temp.	Enclosed transfers, clear lines prior to decoupling	With LEV	PROC4 batch process with exposure	295.09		29.51	6.86	1		0.1	0.1	
	industriali SUS3	Sample collection	CS2	Daily; <15 mins; product temp.; Outdoor;	Closed or ventilated sampling points	No LEV	PROC3 Closed batch process (with sampling)	295.09		29.51	0.34	0.1		0.01	0.01	
	indostrial: : SU3	Laboratory activities	CS 36	Daily; 15 mins - 1 hour; product temp.; Indoor	Fume cupboard. PPE.	With LEV	PROC15 Use in laboratory	147.55		147.55	0.34	0.1		0.1	0.1	
bine in ative as Transfer unless	industrial:-:\$03	Bulk closed loading and unloading NEW CS (e.g. road/rail car bottom	CS 14, CS 107 Bulk transfers (closed systems)	Outdoor; Daily; 15 - 1 hour; product temp.; exposure potential during breaking of hose	Enclosed transfers, clear lines prior to decoupling	No LEV	PROC8b Dedicated Discharging to/from vessels	442.64		13.28	6.86	1		0.1	0.1	
option	industrial \$03	Bulk open loading NEW CS (e.g. road/rail car top loading, may involve LEV)	CS 14, CS 108 Bulk transfers (open systems)	Outdoor; Daily; 1 - 4 hours; product temp ambient; exposure potential from	Enclosed transfers, submerged loading via tank opening,	With LEV	PROC8b Dedicated discharging to/from vessels	442.64		13.28	6.86	1		0.1	0.1	
option	Industrial . 'SU3	Bulk open loading NEW CS (e.g. road/rail car top loading, may involve RPE)	CS 14, CS 108 Bulk transfers (open systems)	Outdoor; Daily; 1 - 4 hours; product temp ambient; exposure potential from	Enclosed transfers, submerged loading via tank opening,	No LEV	PRO C8b Dedicated discharging to/from vessels	442.64		44.26	6.86	1		0.2	0.2	
	industriai - Sid3	Drum and small package filling	CS6	Indoor; Continuous; daily; 8 hour; product temp.	Enclosed transfers, vented transfer points, dedicated filling line	With LEV	PROC9 Transfer of substance/mixtur e into small containers	590.18		59.02	6.86	1		0.1	0.1	
		Clean down and Maintenance	CS 39	Daily; 15 min - 1 hour; product temp; collection of line waste in container	Enclosed lines; retain wash down in sealed storage pending disposal or use as	No LEV	PROC8a Non- dedicated discharging to/from vessels	737.73		73.77	13.71	1		0.2	0.2	
	indostnai - SISS		CS67	Daily; 8 hrs; product temp; Outdoors	Samples collected at dedicated sample point	outdoor activity	PROC1 Closed continuous process (sometimes with sampling)	0.03		0.03	0.34	0.1		0.1	0.1	
	indostrial: : SU3	Storage	CS 67	Daily; 8 hrs; product temp; Outdoors	Samples collected at dedicated sample point	outdoor activity	PROC2 Closed continuous process (sometimes with sampling)	147.55		147.55	1.37	0.2	0	0	0	

A1.2.3 Distribution of Substance - Industrial

			Table 1: Mapp							
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor			
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Distribution of substance	Industrial -SU3	General process exposures - closed process (e.g. In-line additive dosing	CS15	Continuous; Outdoor; daily; 15 - 1 hour; product temp.	Closed process. No exposure.	Closed process. No exposure.	PROC1 Closed process (no sampling)	0.000	0.001	0.001
Combine in narrative	Industrial -SU3	General process exposures (occasional controlled exposure)	CS15	Continuous; Outdoor; daily; 15 mins - 1 hour; product temp.	Enclosed process; closed/semi- closed sampling point	No LEV	PROC2 Closed continuous process (with sampling)	0.049	0.002	0.051
	Industrial - SU3	General process exposures - closed batch process	CS15	Batch process; Outdoor; daily; 15 - 1 hour; product temp.	enclosed or vented sampling points	No LEV	PROC3 Closed batch process (with sampling)	0.010	0.000	0.010
	Industrial -SU3	General exposures open batch process	CS16	Daily; Indoor/Outdoor; 15 - 1 hour; product temp.	Enclosed transfers, clear lines prior to decoupling	With LEV	PROC4 batch process with exposure	0.010	0.001	0.011
	Industrial - SU3	Sample collection	CS2	Daily; <15 mins; product temp.; Outdoor;	Closed or ventilated sampling points	No LEV	PROC3 Closed batch process (with sampling)	0.010	0.000	0.010
	Industrial - SU3	Laboratory activities	CS36	Daily; 15 mins - 1 hour; product temp.; Indoor	Fume cupboard. PPE.	With LEV	PROC15 Use in laboratory	0.049	0.001	0.050
Combine in narrative as Bulk Transfer CS14 unless differentiation	Industriel - SU3	Bulk closed loading and unloading NEW CS (e.g. road/rail car bottom	CS14, CS107 Bulk transfers (closed systems)	Outdoor; Daily; 15 - 1 hour; product temp.; exposure potential during breaking of hose	Enclosed transfers, clear lines prior to decoupling	No LEV	PROC8b Dedicated Discharging to/from vessels	0.004	0.001	0.005
LEV option	Industriel - SU3		CS14, CS108 Bulk transfers (open systems)	Outdoor; Daily; 1 - 4 hours; product temp ambient; exposure potential from	Enclosed transfers, submerged loading via tank opening,	With LEV	PROC8b Dedicated discharging to/from vessels	0.004	0.001	0.005
RPE option	Industrial - SU3		CS14, CS108 Bulk transfers (open systems)	Outdoor; Daily; 1 - 4 hours; product temp ambient; exposure potential from		No LEV	PROC8b Dedicated discharging to/from vessels	0.015	0.002	0.017
	Industrial - SU3		CS6	Indoor; Continuous; daily; 8 hour; product temp.	Enclosed transfers, vented transfer points, dedicated filling line	With LEV	PROC9 Transfer of substance/mixtur e into small containers	0.020	0.001	0.021
	Industrial - SU3	Clean down and Maintenance	CS39	Daily; 15 min - 1 hour; product temp; collection of line waste in container	Enclosed lines; retain wash down in sealed storage pending disposal or use as	No LEV	PROC8a Non- dedicated discharging to/from vessels	0.025	0.002	0.027
	Indostrial - SU3	Storage	CS67	Daily; 8 hrs; product temp; Outdoors	Samples collected at dedicated sample point	outdoor activity	PROC1 Closed continuous process (sometimes with sampling)	0.000	0.001	0.001
	Industrial - SU3	Storage	CS67	Daily; 8 hrs; product temp; Outdoors	Samples collected at dedicated sample point	outdoor activity	PROC2 Closed continuous process (sometimes with sampling)	0.049	0.000	0.049

A1.3.1 Formulation of Substance – Industrial

A1.0.110	riiidiatio	n of Subs			Supply Chain		
				Typical Mapped	Typical Map	oped RMMs	Use Descriptor
	User Group	Contributing Scenarios	CS Ref	Operating Conditions	Text	LEV	Process Category equivalent
Formulation & (re)packing of substances and mixtures	Industrial SU3/SU10	General process exposures (no sampling) (e.g. In- line additive dosing	CS15	Continuous; daily; 15 - 1 hour; product temp.	Closed processes	Closed process. No exposure.	PROC1 Closed process (no sampling)
Combine in with above row in narrative	Industrial - SU3/ SU10	General process exposures and sample collection	CS15	Continuous; daily; 15 mins - 1 hour	Enclosed process; closed/semi- closed sampling point	No LEV	PROC2 Closed continuous process (with sampling)
	industrial -:SU3/ SU10:	General process exposures (e.g. In- line additive dosing equipment, in-line	CS15	Batch process; daily; 15 - 1 hour; product temp.	Closed equipment, enclosed or vented sampling points	No LEV	PROC3 Closed batch process (with sampling)
Combine in narrative	Industrial - SU3/ SU10	General exposures open batch process	CS16	Daily; Indoor; 15 - 1 hour; product temp.	Enclosed transfers, clear lines prior to decoupling, ventilation at	With LEV	PROC4 batch process with exposure
Aerosol potential. Value for moderate dusty	Industrial SU3/ SU10	General exposures open batch process (aerosols)	CS16	Daily; Indoor; 15 - 1 hour; product temp.	Enclosed transfers, clear lines prior to decoupling, ventilation at	With LEV	PROC4 batch process with exposure
Elevated temperature therefore applied value for medium volatility	Industrial - SU3/ SU10:	Batch processes at elevated temperatures (e.g. solvents resin	CS136	product temp.	Closed equipment, enclosed or vented sampling points, vented	With LEV	PROC3 Closed batch process (with sampling)
	IndustrialSU3/ SU10	Sample collection	CS2	Daily; <15 mins; product temp.	Closed or ventilated sampling points	No LEV	PROC3 Closed batch process (with sampling)
	Industrial SU3/ SU3	Laboratory activities	CS36	Daily; 15 mins - 1 hour; product temp.; Indoor	Fume cupboard. PPE.	With LEV	PROC15 Use in laboratory
	Industrial SU3/ SU10	Bulk transfers	CS14	Daily; 15 min - 1 hour; product temp; collection of line waste in container	Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	PROC8b Dedicated discharging to/from vessels
Combine in narrative	Industrial - SU3/ SU10	Mixing operations (open systems)	CS30	Indoor. Batch process; daily; 8 hours; product temp	LEV, PPE	With LEV	PROC5 Mixing or blending
	Industrial - SU3/ SU10	Mixing operations - open systems (aerosols)	CS30	Indoor. Batch process; daily; 8 hours; product temp	LEV, PPE	With LEV	PROC5 Mixing or blending
Combine in narrative	Industrial - SU3/ SU10	Transfer from/pouring from containers , Manual	CS34 + CS22		Manual transfers, LEV, PPE, RPE	With LEV	PROC8a Non- dedicated discharging to/from vessels
	Industrial - SU3/ SU10	Drum/Batch transfers	CS8	Indoor; daily; 15 - 1 hour; product temp.	Drum pump or dedicated drum handling equipment	With LEV	PROC8b Dedicated discharging to/from vessels
	Industrial SU3/ SU10	Tabletting, compression, extrusion or pelletisation	CS100	Indoor; daily; 8 hours; product temp.	LEV, PPE	With LEV	PROC14 Production of preparation by tabletting, compression,
	Industrial - SU2/ SU10	Drum and small package filling	CS6	Indoor, Continuous; daily; 8 hour; product temp.	transfer points	With LEV	PROC9 Transfer of substance/mixtur e into small containers
	Industrial - SU3/ SU10	Clean down and Maintenance	CS39	Indoor, Daily; 1 - 4 hours; product temp; collection of line waste in container	Enclosed lines; retain wash down in sealed storage pending disposal or use as	No LEV	PROC8a Non- dedicated discharging to/from vessels
	Industrial SU3/ SU10	Storage	CS67	Daily; <15 mins (sampling) product temp (ambient);	samples collected at dedicated sample point		PROC1 Closed process (no sampling)
	Industrial SU3/ SU10	Storage	CS67	Daily; <15 mins (sampling) product temp (ambient);	samples collected at dedicated sample point	outdoor activity	PROC2 Closed continuous process (with sampling)

A1.3.2 Formulation of Substance – Industrial

				ping Uses in the					able 2: Charact	erising the Ris	sk - High VP Liq	uids - Chemica	al Safety Asse	ssment - Evalu	ation of Safe Us	е
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor		Inhalatory exposure				Dem al exposure			
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	TRA Predicted Exposure (mg/m3) no modifiers	Inhalation RMM (efficiency)	Predicted Inhalation Exposure (mg/m3)	TRA Predicted Dermal Systemic Exposure (mg/kg/d) - no	TRA Predicted Dermal Local Exposure (mg/cm2/d) -	Dermal RMM (efficiency)	Predicted Systemic Dermal Exposure (mg/kg/d)	Predicted Local Dermal Exposure (mg/cm2/d) modified	Comments
Formulation & (re)packing of substances and mixtures	Dickesting SUGSU10	General process exposures (no sampling) (e.g. In- line additive dosing	CS 15	Continuous; daily; 15 - 1 hour; product temp.	Closed processes	Closed process. No exposure.	PROC1 Closed process (no sampling)	0.03		0.03	0.34	0.1		0.1	0.1	
Combine in with above row in narrative	hdustrist : \$13/ Slint	General process exposures and sample collection	CS 15	Continuous; daily; 15 mins - 1 hour	Enclosed process; closed/semi- closed sampling point	No LEV	PROC2 Closed continuous process (with sampling)	147.55		147.55	1.37	0.2		0.2	0.2	
	industrial - SUS SISTO	General process exposures (e.g. In line additive dosing equipment, in-line	CS 15	Batch process; daily; 15 - 1 hour, product temp.	Closed equipment, enclosed or vented sampling points	No LEV	PROC3 Closed batch process (with sampling)	296.09		206.56	0.34	0.1		0.1	0.1	
Combine in narrative	bddstriat ; SLOC SU10:	General exposures open batch process	CS 16	Daily; Indoor; 15 - 1 hour; product temp.	Enclosed transfers, clear lines prior to decoupling, ventilation at	With LEV	PROC4 batch process with exposure	296.09		206.56	6.86	1		0.2	0.2	
Aerosol potential. Value for moderate dusty	findustriali / SUbi SU(8)	General exposures open batch process (ae rosols)	CS 16	Daily; Indoor; 15 - 1 hour; product temp.	Enclosed transfers, clear lines prior to decoupling, ventilation at	With LEV	PROC4 batch process with exposure	5.00	0	0.00	6.86	1	0	0	0	
Elevated temperature therefore applied value for medium colatility	industrial - SUS- SUIO:	Batch processes at elevated temperatures (e.g. solvents resin	CS 136	Batch process; daily; 15 - 1 hour, product temp.	Closed equipment, enclosed or vented sampling points, vented	With LEV	PROC3 Closed batch process (with sampling)	295.09		206.56	0.34	0.1		0.1	0.1	
	hidushidi - SUS- SUIO.	Sample collection	CS2	Daily; <15 mins; product temp.	Closed or ventilated sampling points	No LEV	PROC3 Closed batch process (with sampling)	296.09		206.56	0.34	0.1		0.1	0.1	
	Industrial - SUS SUS	Laboratory activities	CS36	Daily; 15 mins - 1 hour; product temp.; Indoor	Fume cupboard. PPE.	With LEV	PROC15 Use in laboratory	147.55		147.55	0.34	0.1		0.1	0.1	
	edistrat : \$135 S196	Bulk transfers	CS 14	Daily; 15 min - 1 hour; product temp; collection of line waste in container	Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	PROC8b Dedicated discharging to/from vessels	442.64		147.55	6.86	1		0.1	0.1	
Combine in narrative	edistriat :-\$100 siste	Mixing operations (open systems)	CS 30	Indoor. Batch process; daily; 8 hours; product temp	LEV, PPE	With LEV	PROC5 Mixing or blending	737.73		13.28	13.71	2		0.1	0.1	
	ibidustriat i SUO/ SUITO	Mixing operations - open systems (ae rosols)	CS 30	Indoor. Batch process; daily; 8 hours; product temp	LEV, PPE	With LEV	PROC5 Mixing or blending	5.00	0	0.00	13.71	2	0	0	0	
Combine in narrative	findustrial - SUD. SU(8)	Transfer from/pouring from containers, Manual	CS 34 + CS22	Indoor; daily; 15 - 1 hour; product temp.	Manual transfers, LEV, PPE, RPE	With LEV	PROC8a Non- dedicated discharging to/from vessels	737.73		73.77	13.71	1		0.01	0.01	
	industrial - SUS- SUM	Drum/Batch transfers	CS8	Indoor; daily; 15 - 1 hour; product temp.	Drum pump or dedicated drum handling equipment	With LEV	PROC8b Dedicated discharging to/from vessels	442.64		13.28	6.86	1		0.1	0.1	
	hobshidi - SUS- SUIO	Tabletting, compression, extrusion or pelletisation	CS 100	Indoor; daily; 8 hours; product temp.	LEV, PPE	With LEV	PROC14 Production of preparation by tabletting, compression.	737.73		73.77	3.43	0.5		0.05	0.06	
	industrial SUS SU10	Drum and small package filling	CS6	Indoor, Continuous; daily; 8 hour; product temp.	Enclosed transfers, vented transfer points	With LEV	PROC9 Transfer of substance/mixtur e into small containers	590.18		59.02	6.86	1		0.1	0.1	
	haustrat : \$13/ Sl/r6	Clean down and Maintenance	CS 39	4 hours; product temp; collection of line waste in container	Enclosed lines; retain wash down in sealed storage pending disposal or use as	No LEV	PROC8a Non- dedicated discharging to/fom vessels	737.73		73.77	13.71	1		0.01	0.01	
	60(6): 50(6):	Storage	CS67	Daily; <15 mins (sampling) product temp (ambient);	samples collected at dedicated sample point	outdoor activity	PROC1 Closed process (no sampling)	0.03		0.03	0.34	0.1		0.1	0.1	
	ödistrist ; SU3/, SU(t):	Storage	CS67	Daily; <15 mins (sampling) product temp (ambient);	samples collected at dedicated sample point	outdoor activity	PROC2 Closed continuous process (with sampling)	147.55		147.55	1.37	0.2		0.2	0.2	

A1.3.3 Formulation of Substance – Industrial

			Table 1: Mapı	oing Uses in the	Supply Chain					
				Typical Mapped	Typical Ma	oped RMMs	Use Descriptor			
	User Group	Contributing Scenarios	CS Ref	Operating Conditions	Text	LEV	Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Formulation & (re)packing of substances and mixtures	Industrial SU3/SU10	General process exposures (no sampling) (e.g. In- line additive dosing	CS15	Continuous; daily; 15 - 1 hour; product temp.	Closed processes	Closed process. No exposure.	PROC1 Closed process (no sampling)	0.000	0.001	0.001
Combine in with above row in narrative	fodustrial SU3/ SU40	General process exposures and sample collection	CS15	Continuous; daily; 15 mins - 1 hour	Enclosed process; closed/semi- closed sampling point	No LEV	PROC2 Closed continuous process (with sampling)	0.049	0.002	0.051
	fodustrial SU3/ SU10	General process exposures (e.g. In- line additive dosing equipment, in-line	CS15	Batch process; daily; 15 - 1 hour; product temp.	Closed equipment, enclosed or vented sampling points	No LEV	PROC3 Closed batch process (with sampling)	0.069	0.001	0.070
Combine in narrative	Industrial - SU3/ SU10	General exposures open batch process	CS16	Daily; Indoor; 15 - 1 hour; product temp.	Enclosed transfers, clear lines prior to decoupling, ventilation at	With LEV	PROC4 batch process with exposure	0.069	0.002	0.071
Aerosol potential. Value for moderate dusty	Industrial -SU3/ SU10	General exposures open batch process (ae rosols)	CS16	Daily; Indoor; 15 - 1 hour; product temp.	Enclosed transfers, clear lines prior to decoupling,	With LEV	PROC4 batch process with exposure	#DIV/0!	0.000	#DIV/0!
Elevated temperature therefore applied value for medium volatility	Industrial - SU3/ SU10	Batch processes at elevated temperatures (e.g. solvents resin	CS136	Batch process; daily; 15 - 1 hour; product temp.	Closed equipment, enclosed or vented sampling points, vented	With LEV	PROC3 Closed batch process (with sampling)	0.069	0.001	0.070
volunty	Industrial - SU3/ SU10	Sample collection	CS2	Daily; <15 mins; product temp.	Closed or ventilated sampling points	No LEV	PROC3 Closed batch process (with sampling)	0.069	0.001	0.070
	Industrial - SU3/ SU3	Laboratory activities	CS36	Daily; 15 mins - 1 hour; product temp.; Indoor	Fume cupboard. PPE.	With LEV	PROC15 Use in laboratory	0.049	0.001	0.050
	industrial - SU3/ SU10	Bulk transfers	CS14	Daily; 15 min - 1 hour; product temp; collection of line waste in container	Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	PROC8b Dedicated discharging to/from vessels	0.049	0.001	0.050
Combine in narrative	Industrial SU3/ SU10	Mixing operations (open systems)	CS30	Indoor. Batch process; daily; 8 hours; product temp	LEV, PPE	With LEV	PROC5 Mixing or blending	0.004	0.001	0.005
	Industrial SU3/ SU10	Mixing operations - open systems (aerosols)	CS30	Indoor. Batch process; daily; 8 hours; product temp	LEV, PPE	With LEV	PROC5 Mixing or blending	#DIV/0!	0.000	#DIV/0!
Combine in narrative	lodustral SU3/ SU10	Transfer from/pouring from containers , Manual	CS34 + CS22	Indoor; daily; 15 - 1 hour; product temp.	Manual transfers, LEV, PPE, RPE	With LEV	PROC8a Non- dedicated discharging to/from vessels	0.025	0.000	0.025
	Industrial - SU3/ SU10	Drum/Batch transfers	CS8	Indoor; daily; 15 - 1 hour; product temp.	Drum pump or dedicated drum handling equipment	With LEV	PROC8b Dedicated discharging to/from vessels	0.004	0.001	0.005
	Industrial - SU3/ SU10	Tabletting, compression, extrusion or pelletisation	CS100	Indoor; daily; 8 hours; product temp.	LEV, PPE	With LEV	PROC14 Production of preparation by tabletting, compression,	0.025	0.001	0.025
	Industrial - 9U3/ SU10	Drum and small package filling	CS6	Indoor, Continuous; daily; 8 hour; product temp.	Enclosed transfers, vented transfer points	With LEV	PROC9 Transfer of substance/mixtur e into small containers	0.020	0.001	0.021
\$ 1	industrial: - SU3/ SU10	Clean down and Maintenance	CS39	Indoor, Daily; 1 - 4 hours; product temp; collection of line waste in container	Enclosed lines; retain wash down in sealed storage pending disposal or use as	No LEV	PROC8a Non- dedicated discharging to/from vessels	0.025	0.000	0.025
	Industrial: -SU3/ SU10	Storage	CS67	Daily; <15 mins (sampling) product temp (ambient);	samples collected at dedicated sample point	outdoor activity	PROC1 Closed process (no sampling)	0.000	0.001	0.001
	Industrial - SU3/ SU10	Storage	CS67	Daily; <15 mins (sampling) product temp (ambient);	samples collected at dedicated sample point	outdoor activity	PROC2 Closed continuous process (with sampling)	0.049	0.002	0.051

A1.4.1 Use of Substance in Coatings - Industrial

			Table 1: Mapp	ing Oses in the	oupply onall		
				Typical Mapped	Typical Ma	pped RMMs	Use Descriptor
	User Group	Contributing Scenarios	CS Ref	Operating Conditions	Text	LEV	Process Categor equivalent
Jse in Coatings Industrial Application)	Industrial -SU3	General exposures (closed systems) [CS15].	[CS15]	Continuous; daily; 8hour	Enclosed process; closed/semi- closed sampling point	NO LEV	PROC1 - Use in closed process, no likelihood of exposure
	Industrial -SU3	General exposures (closed systems) [CS15].	[CS15] [CS56] [CS38]	Continuous; daily; 8hour	Enclosed process; closed/semi- closed sampling point	With LEV	PROC2 - Use in closed, continuous process with occasional
	Industrial - SU3	Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing	[CS94]			With LEV	PROC2 - Use in closed, continuous process with occasional
	Industrial - SU3		[CS29] [CS15]			With LEV	PROC3 - Use in closed batch process (synthesis or formulation)
Ouration Option	Industrial - SU3	Film formation - air drying [CS95].	[CS95]	Duration		With LEV	PROC4 - Use in batch and other process (synthesis) wher
RPE Option	Industrial - SU3	Film formation - air drying [CS95].	[CS95]	RPE		With LEV	opportunity for PROC4 - Use in batch and other process (synthesis) wher opportunity for
Ouration Option	Industrial - SU3	Preparation of material for application [CS96].	[CS96] [CS30]	Duration	liquid/ powder products) - batch, indoor/ outdoor.	With LEV	PROC5 -Mixing blending in batch processes (multistage and/o significant
RPE Option	Industrial - SU3	Preparation of material for application [CS96].	[CS96] [CS30]	RPE	liquid/ powder products) - batch, indoor/ outdoor.	With LEV	PROC5 -Mixing blending in batch processes (multistage and/o significant
	Industrial - SU3	Spraying (automatic/robotic) [CS97].	[CS97]	Daily; >4 hours, ambient	Enclosed. Vented spray booth; specific workforce education, PPE	With LEV	PROC7 -Industri spraying
	Industrial - SU3	Manual [CS34].	[CS34] [CS10]		Open , Air supplied masks, respirator.	NO LEV	PROC7 -Industri- spraying
Ouration Option	Industrial - SU3	Material transfers [CS3].	[CS3]	Daily; 15 min - 1 hour; ambient temp; collection of line waste in container.	Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	PROC8a -Transformers of chemicals from/to vessels/ large containers at non dedicated
RPE Option	Industrial - SU3	Material transfers [CS3].	[CS3]	Daily; 15 min - 1 hour; ambient temp; collection of line waste in container.	Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	PROC8a -Transfi of chemicals from/to vessels/ large containers at non dedicated
	Industrial - SU3	Material transfers [CS3].	[CS3]	Daily; 15 min - 1 hour; ambient temp; collection of line waste in container.	Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	PROC8b -Transfi of chemicals from/to vessels/ large containers at dedicated
	Industrial - SU3	Roller, spreader, flow application [CS98].	[CS98]	Daily; >4 hours, ambient. Range from 2-3% upto 40-50%	Local exhaust ventilation at rollers; remove spills as they occur, PPE.	With LEV	PROC10 - Roller application or brushing
	Industrial - SU3	Dipping, immersion and pouring [CS4].	[CS4]	Daily; >4 hours, ambient	Local exhaust ventilation at open surface; remove spills as they occur, PPE	With LEV	PROC13 - Treatment of articles by dippir and pouring
	Industrial - 9U3	Laboratory activities [CS36].	[CS36]	small scale activities small amount, daily 15 min		With LEV	PROC15 - Use of laboratory reagents in small scale laboratorie
Ouration Option	Industrial - SU3	Material transfers [CS3].	[CS3] [CS8] [CS22]	Daily; 15 min - 1 hour; ambient temp;	wear goggles and gloves		PROC9 -Transfer of chemicals into small containers (dedicated filling line)
RPE Option	Industrial - SU3	Material transfers [CS3].	[CS3] [CS8] [CS22]	Daily; 15 min - 1 hour; ambient temp;	wear goggles and gloves	With LEV	PROC9 -Transfer of chemicals into small containers (dedicated filling line)
Ouration Option	Industrial - SU3	Production or preparation or articles by tabletting, compression,	[CS100]	Daily; 15 min - 1 hour; ambient temp;	wear goggles and gloves	With LEV	PROC14 - Production of preparations or articles by tabletting,
RPE Option	Industrial - SU3	Production or preparation or articles by tabletting, compression,	[CS100]	Daily; 15 min - 1 hour; ambient temp;	wear goggles and gloves	With LEV	PROC14 - Production of preparations or articles by tabletting,

A1.4.2 Use of Substance in Coatings – Industrial

			Table 1: Mapp	oing Uses in the	Supply Chair	·		Т	able 2: Charact	terising the Ri	sk - High VP Lic	juids - Chemic	al Safety Asse	ssment - Evalua	ation of Safe Us	e
				Typical Mapped	Typical Ma	pped RMMs	Use Descriptor		Inhalatory exposure				Demal exposure			
	User Group	Contributing Scenarios	CS Ref	Operating Conditions	Text	LEV	Process Category equivalent	TRA Predicted Exposure (mg/m3) no modifiers	Inhalation RMM (efficiency)	Predicted Inhalation Exposure (mg/m3)	TRA Predicted Dermal Systemic Exposure (mg/kg/d) - no	TRA Predicted Dermal Local Exposure (mg/cm2/d) -	Dermal RMM (efficiency)	Predicted Systemic Dermal Exposure (mg/kg/d)	Predicted Local Dermal Exposure (mg/cm2/d) modified	Comments
Use in Coatings (Industrial Application)	Iridustrial -: SU3-	General exposures (closed systems) [CS15].	[CS15]	Continuous; daily; 8hour	Enclosed process; closed/semi- closed sampling	NO LEV	PROC1 - Use in closed process, no likelihood of exposure	0.03		0.03	0.34	0.1		0.1	0.1	
Application)	Indostrial: /\$U3	General exposures (closed systems) [CS15].	[CS15] [CS56] [CS38]	Continuous; daily; 8hour	point Enclosed process; closed/semi- closed sampling	With LEV	PROC2 - Use in closed, continuous process with	147.55		147.55	1.37	0.2		0.2	0.2	
	indostriai - SU3	Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB	[CS94]		point enclosed in situ ir workplace	With LEV	occasional PROC2 - Use in closed, continuous process with	147.55		147.55	1.37	0.2		0.2	0.2	
	ihpogrjei-SU3	radiation curing Mixing operations (closed systems) [CS29].	[CS29] [CS15]			With LEV	occasional PROC3 - Use in closed batch process (synthesis or	295.09		29.51	0.34	0.1	0	0.01	0.01	
turation Option	Industrial - SU3	Film formation - air drying [CS95].	[CS95]	Duration		With LEV	formulation) PROC4 - Use in batch and other process (synthesis) where	295.09		29.51	6.86	1	0	0.1	0.1	
PE Option	Industrial - SU3	Film formation - air drying (CS95).	[CS95]	RPE		With LEV	opportunity for PROC4 - Use in batch and other process (synthesis) where	295.09		29.51	6.96	1	0	0.1	0.1	
luration Option	Industrial - SU3	Preparation of material for application [CS96].	[CS96] [CS30]	Duration	liquid/ powder products) - batch, indoor/ outdoor.	With LEV	opportunity for PRO C5 -Mixing or blending in batch processes (multistage and/or	737.73		73.77	13.71	2		0.01	0.01	
PE Option	Industrial - SU3	Preparation of material for application [CS96].	[CS96] [CS30]	RPE	liquid/ powder products) - batch, indoor/ outdoor.	With LEV	significant PROC5 -Mixing or blending in batch processes (multistage and/or	737.73		73.77	13.71	2		0.01	0.01	
	indostrial \$03	Spraying (automatic/robotic) [CS97].	[CS97]	Daily; >4 hours, ambient	Enclosed. Vented spray booth; specific workforce education, PPE	With LEV	significant PROC7 -Industrial spraying	1475.46	LEV (0.95)	73.77	42.86	2	LEV (0.95)	0.1	0.1	
	indodrjal - SU3	Manual [CS34].	[CS34] [CS10]		Open , Air supplied masks, respirator.	NO LEV	PROC7 -Industrial spraying	1475.46	Vent (0.7) RPE (0.9)	44.26	42.86	2		0.4	0.4	
uration Option	Industrial - SU3	Material transfers [CS3].	(CS3)	Daily; 15 min - 1 hour; ambient temp; collection of line waste in	Enclosed transfers, vented transfer points; clear lines prior to	With LEV	PROC8a -Transfer of chemicals from/to vessels/ large containers	737.73		73.77	13.71	1		0.01	0.01	
PE Option	Industrial - SU3	Material transfers [CS3].	(CS3)	container. Daily; 15 min - 1 hour; ambient temp; collection of line waste in container.	decoupling Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	at non dedicated PROC8a -Transfer of chemicals from/to vessels/ large containers at non dedicated	737.73		73.77	13.71	1		0.01	0.01	
	industrial - SU3	Material transfers (CS3).	[CS3]	Daily; 15 min - 1 hour; ambient temp; collection of line waste in container.	Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	PROC8b -Transfer of chemicals from/to vessels/ large containers at dedicated	442.64		13.28	6.86	1		0.1	0.1	
	Industrial - SU3	Roller, spreader, flow application [CS98].	[CS98]	Daily; >4 hours, ambient. Range from 2-3% upto 40-50%	Local exhaust ventilation at rollers; remove spills as they occur. PPE.	With LEV	PROC10 - Roller application or brushing	737.73		73.77	27.43	2		0.1	0.1	
	Iridubtrial - SU3-	Dipping, immersion and pouring [CS4].	[CS4]	Daily; >4 hours, ambient	Local exhaust ventilation at open surface; remove spills as they occur. PPE	With LEV	PROC13 - Treatment of articles by dipping and pouring	737.73		73.77	13.71	2		0.1	0.1	
	Indostrial SU3	Laboratory activities [CS36].	[CS36]	small scale activities small amount, daily 15 min	many of the	With LEV	PROC15 - Use of laboratory reagents in small scale laboratories	147.55		147.55	0.34	0.1		0.1	0.1	
uration Option	Industrial - SU3	Material transfers [CS3].	[CS3] [CS8] [CS22]	Daily; 15 min - 1 hour; ambient temp;	wear goggles and gloves		PROC9 -Transfer of chemicals into small containers (dedicated filling line)	590.18		59.02	6.86	1		0.1	0.1	
PE Option	Industrial - SU3	Material transfers [CS3].	[CS3] [CS8] [CS22]	Daily; 15 min - 1 hour; ambient temp;	wear goggles and gloves		Ine) PRO C9 - Transfer of chemicals into small containers (dedicated filling line)	590.18		59.02	6.86	1		0.1	0.1	
uration Option	Industrial - SU3	Production or preparation or articles by tabletting, compression,	[CS100]	Daily; 15 min - 1 hour; ambient temp;	wear goggles and gloves	With LEV	PROC14 - Production of preparations or articles by tabletting,	737.73		73.77	3.43	0.5		0.05	0.05	
PE Option	Industrial - SU3	Production or preparation or articles by tabletting,	[CS100]	Daily; 15 min - 1 hour; ambient temp;	wear goggles and gloves	With LEV	PROC14 - Production of preparations or articles by tabletting,	737.73		73.77	3.43	0.5		0.05	0.05	

A1.4.3 Use of Substance in Coatings - Industrial

			Table 1: Mapp	ing Uses in the	Supply Chain					
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor			
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Jse in	Industrial SU3	General	[CS15]	Continuous; daily;		NO LEV	PROC1 - Use in	0.000	0.001	0.001
Coatings Industrial Application)		exposures (closed systems) [CS15].		8hour	process; closed/semi- closed sampling point		closed process, no likelihood of exposure			
	: Industrial ::SU3:	General exposures	[CS15]	Continuous; daily;		With LEV	PROC2 - Use in closed	0.049	0.002	0.051
		(closed systems) [CS15].	[CS56] [CS38]	onou	closed/semi- closed sampling point		continuous process with occasional			
	Industrial - SU3	Film formation - force drying (50 -	[CS94]		enclosed in situ in workplace	With LEV	PROC2 - Use in closed,	0.049	0.002	0.051
		100°C). Stoving (>100°C). UV/EB radiation curing					continuous process with occasional			
	Industrial - SU3	Mixing operations (closed systems)	[CS29] [CS15]			With LEV	PROC3 - Use in closed batch	0.010	0.000	0.010
		[CS29].	(55.15)				process (synthesis or formulation)			
uration Option	Industrial - SU3	Film formation - air drying [CS95].	[CS95]	Duration		With LEV	PROC4 - Use in batch and other	0.010	0.001	0.011
							process (synthesis) where opportunity for			
RPE Option	Industrial - SU3	Film formation - air drying [CS95].	[CS95]	RPE		With LEV	PROC4 - Use in batch and other	0.010	0.001	0.011
		3,000					process (synthesis) where opportunity for			
Ouration Option	Industrial - SU3	Preparation of material for application	[CS96] [CS30]	Duration	liquid/ powder products) - batch, indoor/ outdoor.	With LEV	PROC5 -Mixing or blending in batch processes	0.025	0.000	0.025
		[CS96].					(multistage and/or significant			
RPE Option	Industrial - SU3	Preparation of material for application [CS96].	[CS96] [CS30]	RPE	liquid/ powder products) - batch, indoor/ outdoor.	With LEV	PROC5 -Mixing or blending in batch processes (multistage and/or	0.025	0.000	0.025
	Industrial - SU3	Spraying	[CS97]	Daily; >4 hours,	Enclosed.	With LEV	significant PROC7 -Industrial	0.025	0.001	0.026
		(automatic/robotic) [CS97].	(555.)	ambient	Vented spray booth; specific workforce		spraying			
	Industrial - SU3	Manual [CS34].	[CS34]		education, PPE Open , Air	NO LEV	PROC7 -Industrial	0.015	0.004	0.019
			[CS10]		supplied masks, respirator.		spraying			
Ouration Option	Industrial - SU3	Material transfers	[CS3]	Daily; 15 min - 1	Enclosed	With LEV	PROC8a -Transfer of chemicals	0.025	0.000	0.025
		[CS3].		hour; ambient temp; collection of line waste in container.	transfers, vented transfer points; clear lines prior to decoupling		from/to vessels/ large containers at non dedicated			
RPE Option	Industrial - SU3	Material transfers [CS3].	[CS3]	Daily; 15 min - 1 hour; ambient	Enclosed transfers, vented	With LEV	PROC8a -Transfer of chemicals	0.025	0.000	0.025
		(CSS).		temp; collection of line waste in container.	transfer points; clear lines prior to decoupling		from/to vessels/ large containers at non dedicated			
	Industrial - SU3	Material transfers [CS3].	[CS3]	Daily; 15 min - 1 hour; ambient	Enclosed transfers, vented	With LEV	PROC8b -Transfer of chemicals	0.004	0.001	0.005
		(OOO).		temp; collection of line waste in container.	transfer points; clear lines prior to decoupling		from/to vessels/ large containers at dedicated			
	Industrial - SU3	Roller, spreader, flow application [CS98].	[CS98]	Daily; >4 hours, ambient. Range from 2-3% upto 40-50%	Local exhaust ventilation at rollers; remove spills as they occur, PPE.	With LEV	PROC10 - Roller application or brushing	0.025	0.001	0.026
	Industrial - SU3	Dipping, immersion and pouring [CS4].	[CS4]	Daily; >4 hours, ambient	Local exhaust ventilation at open surface; remove spills as they occur, PPE	With LEV	PROC13 - Treatment of articles by dipping and pouring	0.025	0.001	0.026
	Industrial - SU3	Laboratory activities [CS36].	[CS36]	small scale activities small amount, daily 15 min		With LEV	PROC15 - Use of laboratory reagents in small scale laboratories	0.049	0.001	0.050
Ouration Option	Industrial - SU3	Material transfers [CS3].	[CS3] [CS8] [CS22]	Daily; 15 min - 1 hour; ambient temp;	wear goggles and gloves	With LEV	PROC9 -Transfer of chemicals into small containers (dedicated filling	0.020	0.001	0.021
RPE Option	Industrial - SU3	Material transfers [CS3].	[CS3] [CS8] [CS22]	Daily; 15 min - 1 hour; ambient temp;	wear goggles and gloves	With LEV	line) PROC9 -Transfer of chemicals into small containers (dedicated filling	0.020	0.001	0.021
Ouration Option	Industrial - SU3	Production or preparation or articles by tabletting,	[CS100]	Daily; 15 min - 1 hour; ambient temp;	wear goggles and gloves	With LEV	line) PROC14 - Production of preparations or articles by	0.025	0.001	0.025
RPE Option	Industrial - SU3	compression, Production or	[CS100]	Daily; 15 min - 1	wear goggles and	With LEV	tabletting, PROC14 -	0.025	0.001	0.025
		preparation or articles by tabletting, compression,		hour; ambient temp;	gloves		Production of preparations or articles by tabletting,			

A1.5.1 Use of Substance in Cleaning Agents - Industrial

				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Categor equivalent
Duration option	Industrial - SU2	Bulk transfers	[CS14]	Daily; 15 min - 1	Enclosed	Yes	PROC8a -Transfe
Dui audii opudii	nuusuu 303	[CS14].	[0314]	hour; ambient temp; collection of line waste in	transfers, vented transfer points; clear lines prior to	res	of chemicals from/to vessels/ large containers
		2 "		container	decoupling		at non dedicated
RPE Option	Industrial - SU3	Bulk transfers [CS14].	[CS14]	Daily; 15 min - 1 hour; ambient temp; collection of line waste in	Enclosed transfers, vented transfer points; clear lines prior to	Yes	PROC8a -Transfe of chemicals from/to vessels/ large containers
Duration option	Industrial - SU3	Automated	[CS93]	container daily; 8hour	decoupling Enclosed	No	at non dedicated PROC2 - Use in
		process with (semi) closed systems. [CS93].			process; closed/semi- closed		closed, continuous process with occasional
RPE Option	Industrial - SU3	Automated process with (semi) closed systems. [CS93].	[CS93]	daily; 8hour	Enclosed process; closed/semi- closed	No	PROC2 - Use in closed, continuous process with occasional
Duration option	Industrial - SU3	Automated process with (semi) closed	[CS93]	daily; 15min - 1 hour; ambient temp	Enclosed process; closed/semi- closed	No	PROC3 - Use in closed batch process
		systems. [CS93].					(synthesis or formulation)
RPE Option	Industrial - SU3	Automated process with (semi) closed systems. [CS93].	[CS93]	daily; 15min - 1 hour; ambient temp	Enclosed process; closed/semi- closed	No	PROC3 - Use in closed batch process (synthesis or formulation)
Duration option	Industrial - SU3	Application of cleaning products in closed systems	[CS101]	daily; 8hour	Enclosed process; closed/semi- closed	No	PROC2 - Use in closed, continuous process with
RPE Option	Industrial - SU3	[CS101]. Application of	[CS101]	daily; 8hour	Enclosed	No	occasional PROC2 - Use in
		cleaning products in closed systems [CS101].			process; closed/semi- closed		closed, continuous process with occasional
Duration option	Industrial - SU3	Filling / preparation of equipment from drums or	[CS45]	daily; 15min - 1 hour; ambient temp	Pumped transfer from drum to equipment	Yes	PROC8b -Transfe of chemicals from/to vessels/ large containers
DDE 0 "		containers.	100.15	1 11 45 1 4			at dedicated
RPE Option	Industrial - SU3	Filling / preparation of equipment from drums or containers.	[CS45]	daily; 15min - 1 hour; ambient temp	Pumped transfer from drum to equipment	Yes	PROC8b -Transfe of chemicals from/to vessels/ large containers at dedicated
Duration option	Industrial - SU3	Use in contained batch processes [CS37].	[CS37]	Daily; 1-4 hours, temperature above boiling point	Closed equipment, enclosed or vented transfer points	Yes	PROC4 - Use in batch and other process (synthesis) where opportunity for
RPE Option	Industrial - SU3	Use in contained batch processes [CS37].	[CS37]	Daily; 1-4 hours, temperature above boiling point	Closed equipment, enclosed or vented transfer	Yes	PROC4 - Use in batch and other process (synthesis) where
Duration option	Industrial - SU3	Degreasing small objects in cleaning station	[CS41]	Daily; >4 hours, ambient	points Local exhaust ventilation at open surface; remove	Yes	opportunity for PROC13 - Treatment of articles by dippin
		[CS41].			spills as they occur, PPE		and pouring
RPE Option	Industrial - SU3	Degreasing small objects in cleaning station [CS41].	[CS41]	Daily; >4 hours, ambient	Local exhaust ventilation at open surface; remove spills as they occur, PPE	Yes	PROC13 - Treatment of articles by dippin and pouring
Duration option	Industrial - SU3	Cleaning with low- pressure washers [CS42].	[CS42]	Daily; 15min - 1hour; ambient temp	specific workforce education, PPE	No	PROC10 - Roller application or brushing
RPE Option	Industrial - SU3	Cleaning with low- pressure washers [CS42].	[CS42]	Daily; 15min - 1hour; ambient temp	specific workforce education, PPE	No	PROC10 - Roller application or brushing
Duration option	Industrial - SU3	Cleaning with high pressure washers [CS44].	[CS44]	Daily; 15min - 1hour; ambient temp	specific workforce education, PPE	No	PROC7 -Industria spraying
RPE Option	Industrial - SU3	Cleaning with high pressure washers	[CS44]	Daily; 15min - 1hour; ambient	specific workforce education, PPE	No	PROC7 -Industria
		[CS44].		temp			
Duration option	Industrial - SU3	Manual [CS34].	[CS34]	Daily; 15 min - 1 hour; ambient temp;	collection of waste and wipe cloths in container.	No	PROC10 - Roller application or brushing
RPE Option	Industrial - SU3	Manual [CS34].	[CS34]	Daily; 15 min - 1 hour; ambient temp;	collection of waste and wipe cloths in	No	PROC10 - Roller application or brushing

A1.5.2 Use of Substance in Cleaning Agents - Industrial

		e or S		ping Uses in th				Т	able 2: Charac	terising the Ri	sk - High VP Liq	uids - Chemic	al Safety Asse	ssment - Evalu	ation of Safe Us	ie
				Typical Mapped	Typical Ma	pped RMMs	Use Descriptor		Inhalatory exposure	e			Demal exposure	,		
	User Group	Contributing Scenarios	CS Ref	Operating Conditions	Text	LEV	Process Category equivalent	TRA Predicted Exposure (mg/m3) no modifiers	Inhalation RMM (efficiency)	Predicted Inhalation Exposure (mg/m3)	TRA Predicted Dermal Systemic Exposure (mg/kg/d) - no	TRA Predicted Dermal Local Exposure (mg/cm2/d) -	Dermal RMM (efficiency)	Predicted Systemic Dermal Exposure (mg/kg/d)	Predicted Local Dermal Exposure (mg/cm2/d) modified	Co
Duration ontion	Industrial - SUS	Bulk transfers	ICS141	Daily: 15 min - 1	Enclosed	Yes	PRO C8a -Transfer	737.73		73.77	13.71	1		0.01	0.01	
		[CS 14].	(==.,)	hour; ambient temp; collection of line waste in	transfers, vented transfer points; clear lines prior to		of chemicals from/to vessels/ large containers									
RPE Option	Industrial - SU3	Bulk transfers [CS 14].	[CS14]	container Daily; 15 min - 1 hour; ambient temp; collection	decoupling Enclosed transfers, vented transfer points;	Yes	at non dedicated PROC8a -Transfer of chemicals from/to vessels/	737.73		73.77	13.71	1		0.01	0.01	
Duration option	Industrial - SU3	Automated	ICS931	of line waste in container daily; 8hour	transter points; clear lines prior to decoupling Enclosed	No	large containers at non dedicated PROC2 - Use in	147 55		147 55	1.37	0.2		0.2	0.2	
		process with (semi) closed systems. [CS93].	(2005)		process; closed/semi- closed		closed, continuous process with occasional									
RPE Option	Industrial - SU3	Automated process with (semi) closed systems. [CS93].	[CS93]	daily; 8hour	Enclosed process; closed/semi- closed	No	PROC2 - Use in closed, continuous process with	147.55		147.55	1.37	0.2		0.2	0.2	
Duration option	Industrial - SU3	Automated process with (semi) closed systems. [CS93].	[CS93]	daily; 15min - 1 hour; ambient temp	Enclosed process; closed/semi- closed	No	occasional PROC3 - Use in closed batch process (synthesis or	295.09		177.06	0.34	0.1		0.1	0.1	
RPE Option	Industrial - SU3	Automated process with (semi) closed	[CS93]	daily; 15min - 1 hour; ambient temp	Enclosed process; closed/semi-	No	formulation) PROC3 - Use in closed batch process	295.09		29.51	0.34	0.1		0.1	0.1	
Duration option	Industrial - SU3	systems. [CS93]. Application of	[CS101]	daily; 8hour	closed	No	(synthesis or formulation) PROC2 - Use in	147.55		147.55	1.37	0.2		0.2	0.2	
		cleaning products in closed systems [CS 101].			process; closed/semi- closed		closed, continuous process with occasional									
RPE Option	Industrial - SU3	Application of cleaning products in closed systems	[CS101]	daily; 8hour	Enclosed process; closed/semi- closed	No	PROC2 - Use in closed, continuous process with	147.55		147.55	1.37	0.2		0.2	0.2	
Duration option	Industrial - SU3	[CS 101]. Filling / preparation of equipment from drums or	[CS45]	daily; 15min - 1 hour; ambient temp	Pumped transfer from drum to equipment	Yes	occasional PRO C8b -Transfer of chemicals from/to vessels/ large containers	442.64		13.28	6.86	1		0.1	0.1	
RPE Option	Industrial - SU3	containers. Filling / preparation of equipment from	[CS45]	daily; 15min - 1 hour; ambient temp	Pumped transfer from drum to equipment	Yes	at dedicated PROC8b -Transfer of chemicals from/to vessels/	442.64		13.28	6.86	1		0.1	0.1	
Duration option	Industrial - SU3	drums or containers. Use in contained	[CS37]	Daily; 1-4 hours,	Closed	Yes	large containers at dedicated PROC4 - Use in	295.09		29.51	6.86	1		0.1	0.1	
		batch processes [CS 37].		temperature above boiling point	equipment, enclosed or vented transfer points		batch and other process (synthesis) where opportunity for									
RPE Option	Industrial - SU3	Use in contained batch processes [CS 37].	[CS37]	Daily; 1-4 hours, temperature above boiling point	Closed equipment, enclosed or vented transfer	Yes	PROC4 - Use in batch and other process (synthesis) where	295.09		29.51	6.86	1		0.1	0.1	
Duration option	Industrial - SU3	Degreasing small objects in cleaning station [CS 41].	[CS41]	Daily; >4 hours, ambient	points Local exhaust ventilation at open surface; remove spills as they	Yes	opportunity for PROC13 - Treatment of articles by dipping and pouring	737.73		73.77	13.71	2		0.1	0.1	
RPE Option	Industrial - SU3	Degreasing small objects in cleaning station	[CS41]	Daily; >4 hours, ambient	spills as they occur, PPE Local exhaust ventilation at open surface: remove	Yes	PROC13 - Treatment of articles by dipping	737.73		73.77	13.71	2		0.1	0.1	
Duration option	Industrial - SU3	[CS41]. Cleaning with low- pressure washers	[CS42]	Daily; 15min - 1hour; ambient	spills as they occur, PPE specific workforce education, PPE	No	and pouring PROC10 - Roller application or	737.73		221.32	27.43	2		0.4	0.4	
		[CS42].		temp			brushing									
RPE Option	Industrial - SU3	Cleaning with low- pressure washers [CS 42].	[CS42]	Daily; 15min - 1hour; ambient temp	specific workforce education, PPE	No	PROC10 - Roller application or brushing	737.73		221.32	27.43	2		0.4	0.4	
Duration option	Industrial - SU3	Cleaning with high pressure washers [CS 44].	[CS44]	Daily; 15min - 1hour; ambient temp	specific workforce education, PPE	No	PROC7 -Industrial spraying	1475.46	Vent (0.7) Duration (0.4)	265.58	42.86	2	Gloves 0.8	0.4	0.4	
RPE Option	Industrial - SU3	Cleaning with high pressure washers [CS 44].	[CS44]	Daily; 15min - 1hour; ambient temp	specific workforce education, PPE	No	PROC7 -Industrial spraying	1475.46	RPE (0.9)	147.55	42.86	2	0	0.4	0.4	
Ouration option	Industrial - SU3	Manual [CS34].	[CS34]	Daily; 15 min - 1 hour; ambient temp;	collection of waste and wipe cloths in container.	No	PROC10 - Roller application or brushing	737.73		221.32	27.43	2		0.4	0.4	
RPE Option	Industrial - SU3	Manual [CS34].	[CS34]	Daily; 15 min - 1 hour; ambient temp;	collection of waste and wipe cloths in	No	PROC10 - Roller application or brushing	737.73		221.32	27.43	2		0.4	0.4	

A1.5.3 Use of Substance in Cleaning Agents - Industrial

			Table 1: Map	ping Uses in th	e Supply Chain	ı				
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor			
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Duration option	Industrial - SU3	Bulk transfers	[CS14]	Daily; 15 min - 1	Enclosed	Yes	PROC8a -Transfer	0.025	0.000	0.025
		[CS14].		hour; ambient temp; collection of line waste in container	transfers, vented transfer points; clear lines prior to decoupling		of chemicals from/to vessels/ large containers at non dedicated			
RPE Option	Industrial - SU3	Bulk transfers [CS14].	[CS14]	Daily; 15 min - 1 hour; ambient temp; collection of line waste in	Enclosed transfers, vented transfer points; clear lines prior to decoupling	Yes	PROC8a -Transfer of chemicals from/to vessels/ large containers at non dedicated	0.025	0.000	0.025
Duration option	Industrial - SU3	Automated process with (semi) closed systems. [CS93].	[CS93]	container daily; 8hour	Enclosed process; closed/semi- closed	No	PROC2 - Use in closed, continuous process with occasional	0.049	0.002	0.051
RPE Option	Industrial - SU3	Automated process with (semi) closed systems. [CS93].	[CS93]	daily; 8hour	Enclosed process; closed/semi- closed	No	PROC2 - Use in closed, continuous process with occasional	0.049	0.002	0.051
Duration option	Industrial - SU3	Automated process with (semi) closed systems. [CS93].	[CS93]	daily; 15min - 1 hour; ambient temp	Enclosed process; closed/semi- closed	No	PROC3 - Use in closed batch process (synthesis or formulation)	0.059	0.001	0.060
RPE Option	Industrial - SU3	Automated process with (semi) closed systems. [CS93].	[CS93]	daily; 15min - 1 hour; ambient temp	Enclosed process; closed/semi- closed	No	PROC3 - Use in closed batch process (synthesis or formulation)	0.010	0.001	0.011
Duration option	Industrial - SU3	Application of cleaning products in closed systems [CS101].	[CS101]	daily; 8hour	Enclosed process; closed/semi- closed	No	PROC2 - Use in closed, continuous process with occasional	0.049	0.002	0.051
RPE Option	Industrial - SU3	Application of cleaning products in closed systems [CS101].	[CS101]	daily; 8hour	Enclosed process; closed/semi- closed	No	PROC2 - Use in closed, continuous process with occasional	0.049	0.002	0.051
Duration option	Industrial - SU3	Filling / preparation of equipment from drums or containers.	[CS45]	daily; 15min - 1 hour; ambient temp	Pumped transfer from drum to equipment	Yes	PROC8b -Transfer of chemicals from/to vessels/ large containers at dedicated	0.004	0.001	0.005
RPE Option	Industrial - SU3	Filling / preparation of equipment from drums or containers.	[CS45]	daily; 15min - 1 hour; ambient temp	Pumped transfer from drum to equipment	Yes	PROC8b -Transfer of chemicals from/to vessels/ large containers at dedicated	0.004	0.001	0.005
Duration option	Industrial - SU3	Use in contained batch processes [CS37].	[CS37]	Daily; 1-4 hours, temperature above boiling point	Closed equipment, enclosed or vented transfer points	Yes	PROC4 - Use in batch and other process (synthesis) where opportunity for	0.010	0.001	0.011
RPE Option	Industrial - SU3	Use in contained batch processes [CS37].	[CS37]	Daily; 1-4 hours, temperature above boiling point	Closed equipment, enclosed or vented transfer points	Yes	PROC4 - Use in batch and other process (synthesis) where opportunity for	0.010	0.001	0.011
Duration option	Industrial - SU3	Degreasing small objects in cleaning station [CS41].	[CS41]	Daily; >4 hours, ambient	Local exhaust ventilation at open surface; remove spills as they occur, PPE	Yes	PROC13 - Treatment of articles by dipping and pouring	0.025	0.001	0.026
RPE Option	Industrial - SU3	Degreasing small objects in cleaning station [CS41].	[CS41]	Daily; >4 hours, ambient	Local exhaust ventilation at open surface; remove spills as they occur, PPE	Yes	PROC13 - Treatment of articles by dipping and pouring	0.025	0.001	0.026
Duration option	Industrial - SU3	Cleaning with low- pressure washers [CS42].	[CS42]	Daily; 15min - 1hour; ambient temp	specific workforce education, PPE	No	PROC10 - Roller application or brushing	0.074	0.004	0.078
RPE Option	Industrial - SU3	Cleaning with low- pressure washers [CS42].	[CS42]	Daily; 15min - 1hour; ambient temp	specific workforce education, PPE	No	PROC10 - Roller application or brushing	0.074	0.004	0.078
Duration option	Industrial - SU3	Cleaning with high pressure washers [CS44].	[CS44]	Daily; 15min - 1hour; ambient temp	specific workforce education, PPE	No	PROC7 -Industrial spraying	0.089	0.004	0.093
RPE Option	Industrial - SU3	Cleaning with high pressure washers [CS44].	[CS44]	Daily; 15min - 1hour; ambient temp	specific workforce education, PPE	No	PROC7 -Industrial spraying	0.049	0.004	0.053
Duration option	Industrial - SU3	Manual [CS34].	[CS34]	Daily; 15 min - 1 hour; ambient temp;	collection of waste and wipe cloths in container.	No	PROC10 - Roller application or brushing	0.074	0.004	0.078
RPE Option	Industrial - SU3	Manual [CS34].	[CS34]	Daily; 15 min - 1 hour; ambient temp;	collection of waste and wipe cloths in container.	No	PROC10 - Roller application or brushing	0.074	0.004	0.078

A1.6.1 Use of Substance in Blowing Agents - Industrial

				ping Uses in the			
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Catego equivalent
wing agents	Industrial - SU 3	Delivery of solvent to plant storage	CS14	Closed system, ambient temp. Filling point outdoors. Exposure	Dedicated line couplings. Operator in attendance.	NO LEV	PROC8b
	Industrial - SU 3	Injection and mixing into molten polymer mass in extruder	CS29	Closed system, high temp., high pressure	High integrity packings etc	NO LEV	PROC1
	Industrial - SU 3	Foam production through polymer extrusion	CS122	Indoor, ambient temp.	Extrusion area under LEV (slot design)	With LEV	PROC12
	Industrial - SU 3	Foam panel finishing (shaving/cutting)	CS134	Enclosed area (no operator) under LEV	Enclosure area under LEV	With LEV	PROC12
	Industrial - SU 3	Foam panel shavings recycling	CS123	Indoor, ambient temp.	Enclosure area under LEV	With LEV	PROC12
	Industrial - SU 3	Foam panel packing	CS124	Indoor, ambient temp.	General ventilation	NO LEV	PROC12
	Industrial - SU 3	Foam panel curing	CS67	Indoor, ambient temp. Warehouse operations with forklift truck. No	General ventilation	NO LEV	PROC12
	Industrial - SU 3	Mixing with polystyrene beads in reactor	CS29	direct contact Closed system, Operating Temp. 120-130 dC; 4.5% agent in mix	automatic	With LEV	PROC3
	Industrial - SU 3	Transfer to and holding in waiting tank	CS66 OC7	Closed system, elevated temperature; 4.5% agent in mix	operation; forced Closed system; remotely controlled / automatic	NO LEV	PROC3
	Industrial - SU 3	Centrifuging of slurry of beads and process water	CS127 OC7	Closed system, elevated temperature; 4.5% agent in mix	operation; forced Closed system; remotely controlled / automatic	NO LEV	PROC3
	Industrial - SU 3	Drying of polystyrene powder/granules	CS12	Indoor, ambient temp. Dedicated equipment.	operation; forced Vented silo	NO LEV	PROC12
	Industrial - SU 3	Loading/packagin g for transport to customers	CS128	Indoor, ambient temp. Dedicated equipment.	Forced ventilation	NO LEV	PROC8b
	Industrial - SU 3	Steam-heating and expansion of expandable polystyrene	CS129 OC7	4% blowing agent in granulate; Elevated temperature	Ventilation, waste air treatment	NO LEV	PROC12
	Industrial - SU 3	granulate Storage and ageing of partially expanded polystyrene	CS129	Open silo's; 3% blowing agent in granulate	Vented silo	NO LEV	PROC12
	Industrial - SU 3	granulate Moulding and block forming with expanded polystyrene granulate	CS130 OC7	Use of steam in partially closed moulds; elevated temperature; 2% blowing agent in	Local exhaust ventilation (80%)	With LEV	PROC12
	Industrial - SU 3	Storage and cutting of expanded polystyrene articles	CS131	Vented storage; cutting by heated wire; 1% blowing agent in granulate	Forced ventilation	With LEV	PROC12
	Industrial - SU 3	Injection and mixing into pre- reaction component in blending tank	CS29	Closed system, ambient temp. Assume 5% agent in blend	Closed system	With LEV	PROC3
	Industrial - SU 3	Drum filling blended mix	CS6, CS45	Indoor, ambient temp.	Filling station under LEV; remotely operated	With LEV	PROC9
	Industrial - SU 3	Foam production through mixing of reactive components	CS132	Indoor, ambient temp. Automated machinery.	Foaming area under LEV (slot design and/or enclosure)	With LEV	PROC12
	Industrial - SU 3	Foam compression to expel residual blowing agent	CS133	Indoor, ambient temp. Automated machinery.	LEV/enclosure	With LEV	PROC12
	Industrial - SU 3	Foam article automated cutting	CS131	Enclosed area (no operator) under LEV; only traces of blowing agent	LEV/enclosure	With LEV	PROC12

A1.6.2 Use of Substance in Blowing Agents - Industrial

			Table 1: Map	ping Uses in the	Supply Chair			Т	able 2: Charact	erising the Ri	sk - High VP Liq	juids - Chemica	al Safety Asse	ssment - Evalu	ation of Safe Us	ie
_				Typical Mapped	Typical Ma	pped RMMs	Use Descriptor		Inhalatory exposure	,			Dem al exposure			
Use	er Group	Contributing Scenarios	CS Ref	Operating Conditions	Text	LEV	Process Category equivalent	TRA Predicted Exposure (mg/m3) no modifiers	Inhalation RMM (efficiency)	Predicted Inhalation Exposure (mg/m3)	TRA Predicted Dermal Systemic Exposure (mg/kg/d) - no	TRA Predicted Dermal Local Exposure (mg/cm2/d) -	Dermal RMM (efficiency)	Predicted Systemic Dermal Exposure (mg/kg/d)	Predicted Local Dermal Exposure (mg/cm2/d) modified	Camr
gents Industr	rial - SU 3	Delivery of solvent to plant storage	CS14	Closed system, ambient temp. Filling point outdoors.	Dedicated line couplings. Operator in attendance.	NO LEV	PRO C8b	442.64		265.58	6.86	1		0.12	0.12	
Industr	rial - SU 3	Injection and mixing into molten polymer mass in extruder	CS29	Exposure Closed system, high temp., high pressure	High integrity packings etc	NO LEV	PROC1	0.03		0.03	0.34	0.1		0.1	0.1	
Industr	rial - SU 3	Foam production through polymer extrusion	CS122	Indoor, ambient temp.	Extrusion area under LEV (slot design)	With LEV	PROC12	295.09		59.02	0.34	0.1		0.01	0.01	
Industr	rial - SU 3	Foam panel finishing (shaving/cutting)	CS134	Enclosed area (no operator) under LEV	Enclosure area under LEV	With LEV	PROC12	295.09		59.02	0.34	0.1		0.01	0.01	
Industr	rial - SU 3	Foam panel shavings recycling	CS123	Indoor, ambient temp.	Enclosure area under LEV	With LEV	PROC12	295.09		59.02	0.34	0.1		0.01	0.01	
Industr	rial - SU 3	Foam panel packing	CS124	Indoor, ambient temp.	General ventilation	NO LEV	PROC12	295.09		206.56	0.34	0.1		0.1	0.1	
Industr	rial - SU 3	Foam panel curing	CS67	Indoor, ambient temp. Warehouse operations with forklift truck. No	General ventilation	NO LEV	PROC12	295.09		206.56	0.34	0.1		0.1	0.1	
Industr	rial - SU 3	Mixing with polystyrene beads in reactor	CS29	direct contact Closed system, Operating Temp. 120-130 dC; 4.5% agent in mix	Closed system; remotely controlled / automatic	With LEV	PROC3	295.09		206.56	0.34	0.1		0.1	0.1	
Industr	rial - SU 3	Transfer to and holding in waiting tank	CS66 OC7	Closed system, elevated temperature; 4.5% agent in mix	operation; forced Closed system; remotely controlled / automatic	NO LEV	PROC3	295.09		206.56	0.34	0.1		0.1	0.1	
Industr	rial - SU 3	Centrifuging of slurry of beads and process water	CS127 OC7	Closed system, elevated temperature; 4.5% agent in mix	operation; forced Closed system; remotely controlled / automatic	NO LEV	PROC3	295.09		206.56	0.34	0.1		0.1	0.1	
Industr	rial - SU 3	Drying of polystyrene powder/granules	CS12	Indoor, ambient temp. Dedicated equipment.	operation; forced Vented silo	NO LEV	PROC12	295.09		206.56	0.34	0.1		0.1	0.1	
Industr	rial - SU 3	Loading/packagin g for transport to customers	CS128	Indoor, ambient temp. Dedicated equipment.	Forced ventilation	NO LEV	PRO C8b	442.64		132.79	6.96	1		0.2	0.2	
Industr	rial - SU 3	Steam-heating and expansion of expandable polystyrene granulate	CS129 OC7	4% blowing agent in granulate; Elevated temperature	Ventilation, waste air treatment	NO LEV	PROC12	295.09		206.56	0.34	0.1		0.1	0.1	
Industr	rial - SU 3	Storage and ageing of partially expanded polystyrene granulate	CS129	Open silo's; 3% blowing agent in granulate	Vented silo	NO LEV	PROC12	295.09		206.56	0.34	0.1		0.1	0.1	
	rial - SU 3	Moulding and block forming with expanded polystyrene granulate	CS130 OC7	Use of steam in partially closed moulds; elevated temperature; 2% blowing agent in	Local exhaust ventilation (80%)	With LEV	PROC12	295.09		206.56	0.34	0.1		0.1	0.1	
	rial - SU 3	Storage and cutting of expanded polystyrene articles	CS131	Vented storage; cutting by heated wire; 1% blowing agent in granulate	Forced ventilation	With LEV	PROC12	295.09		206.56	0.34	0.1		0.1	0.1	
	rial - SU 3	Injection and mixing into pre- reaction component in blending tank	CS29	Closed system, ambient temp. Assume 5% agent in blend	Closed system	With LEV	PROC3	295.09		29.51	0.34	0.1		0.1	0.1	
	rial - SU 3	Drum filling blended mix	CS6, CS45	Indoor, ambient temp.	Filling station under LEV; remotely operated	With LEV	PROC9	590.18		59.02	6.86	1		0.1	0.1	
	rial - SU 3	Foam production through mixing of reactive components	CS132	Indoor, ambient temp. Automated machinery.	Foaming area under LEV (slot design and/or enclosure)	With LEV	PROC12	295.09		59.02	0.34	0.1		0.01	0.01	
	rial - SU 3	Foam compression to expel residual blowing agent	CS133	Indoor, ambient temp. Automated machinery.	LEV/enclosure	With LEV	PROC12	295.09		59.02	0.34	0.1		0.01	0.01	
Industr	rial - SU 3	Foam article automated cutting	CS131	Enclosed area (no operator) under LEV; only traces of blowing agent	LEV/enclosure	With LEV	PROC12	295.09		59.02	0.34	0.1		0.01	0.01	

A1.6.3 Use of Substance in Blowing Agents - Industrial

			таріе 1: Мар	ping Uses in the	Supply Chain					
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor			
User Gr	roup	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCI (all routes)
Industrial -	SU 3	Delivery of solvent	CS14	Closed system,	Dedicated line	NO LEV	PROC8b	0.089	0.001	0.090
		to plant storage		ambient temp. Filling point outdoors. Exposure	couplings. Operator in attendance.					
Industrial -	SU 3	Injection and mixing into	CS29	Closed system, high temp., high	High integrity packings etc	NO LEV	PROC1	0.000	0.001	0.001
		molten polymer mass in extruder		pressure	packings etc					
Industrial -	SU 3	Foam production through polymer extrusion	CS122	Indoor, ambient temp.	Extrusion area under LEV (slot design)	With LEV	PROC12	0.020	0.000	0.020
Industrial -	SU 3	Foam panel finishing (shaving/cutting)	CS134	Enclosed area (no operator) under LEV	under LEV	With LEV	PROC12	0.020	0.000	0.020
Industrial -	SU 3	Foam panel	CS123	Indoor, ambient	Enclosure area	With LEV	PROC12	0.020	0.000	0.020
		shavings recycling		temp.	under LEV					
Industrial -	SU 3	Foam panel	CS124	Indoor, ambient	General	NO LEV	PROC12	0.069	0.001	0.070
		packing		temp.	ventilation					
Industrial -	SU 3	Foam panel	CS67	Indoor, ambient	General	NO LEV	PROC12	0.069	0.001	0.070
		curing		temp. Warehouse operations with forklift truck. No	ventilation					
Industrial -	SU 3	Mixing with	CS29	Closed system,	Closed system;	With LEV	PROC3	0.069	0.001	0.070
		polystyrene beads in reactor		Operating Temp. 120-130 dC; 4.5% agent in mix	remotely controlled / automatic					
Industrial -	SU 3	Transfer to and	CS66	Closed system,	operation; forced Closed system;	NO LEV	PROC3	0.069	0.001	0.070
		holding in waiting tank	OC7	elevated temperature; 4.5% agent in mix						
Industrial -	SU 3	Centrifuging of	CS127	Closed system,	operation; forced Closed system;	NO LEV	PROC3	0.069	0.001	0.070
		slurry of beads and process water	OC7	elevated temperature; 4.5% agent in mix	remotely controlled / automatic					
Industrial -	SU 3	Drying of polystyrene powder/granules	CS12	Indoor, ambient temp. Dedicated equipment.	operation; forced Vented silo	NO LEV	PROC12	0.069	0.001	0.070
Industrial -	SU 3	Loading/packagin g for transport to customers	CS128	Indoor, ambient temp. Dedicated equipment.	Forced ventilation	NO LEV	PROC8b	0.044	0.002	0.046
Industrial -	SU 3	Steam-heating	CS129	4% blowing agent	Ventilation, waste	NO LEV	PROC12	0.069	0.001	0.070
		and expansion of expandable polystyrene	OC7	in granulate; Elevated temperature	air treatment					
Industrial -	SU 3	granulate Storage and	CS129	Open silo's; 3%	Vented silo	NO LEV	PROC12	0.069	0.001	0.070
		ageing of partially expanded polystyrene		blowing agent in granulate						
Industrial -	SU 3	granulate Moulding and	CS130	Use of steam in	Local exhaust	With LEV	PROC12	0.069	0.001	0.070
		block forming with expanded polystyrene granulate	OC7	partially closed moulds; elevated temperature; 2% blowing agent in						
Industrial -	SU 3	Storage and cutting of	CS131	Vented storage; cutting by heated	Forced ventilation	With LEV	PROC12	0.069	0.001	0.070
		expanded polystyrene		wire; 1% blowing agent in granulate						
Industrial -	SU 3	articles Injection and	CS29	Closed system,	Closed system	With LEV	PROC3	0.010	0.001	0.011
		mixing into pre- reaction component in		ambient temp. Assume 5% agent in blend						
Industrial -	SU 3	blending tank Drum filling blended mix	CS6, CS45	Indoor, ambient temp.	Filling station under LEV;	With LEV	PROC9	0.020	0.001	0.021
					remotely operated					
Industrial -	SU 3	Foam production through mixing of reactive	CS132	Indoor, ambient temp. Automated machinery.	Foaming area under LEV (slot design and/or enclosure)	With LEV	PROC12	0.020	0.000	0.020
Industrial -	SU 3	components	CS133	Indoor, ambient	LEV/enclosure	With LEV	PROC12	0.020	0.000	0.020
austriai =	J-J -J	compression to expel residual blowing agent	55155	temp. Automated machinery.		.viai LEV		3.020	0.000	0.020
Industrial -	SU 3	Foam article	CS131	Enclosed area (no	LEV/enclosure	With LEV	PROC12	0.020	0.000	0.020
		automated cutting		operator) under LEV; only traces of blowing agent left						

A1.7.1 Use of Substance in Fuels - Professional

			Table 1: Mapp	oing Uses in the	Supply Chain		
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent
Use as a fuel	Professional SU22	Bulk transfers (e.g. heating oil and diesel deliveries)	CS14	Daily; 1-4 hour; ambient temp., Outdoors	Enclosed transfers, clear lines prior to decoupling	No LEV	PROC8b Dedicated Discharging to/from vessels
Combine in narrative	Professional SU22	Transfers from drums and containers	CS8	Daily; 15 mins - 1 hour; ambient temp	Pumped transfer from drum to equipment	No LEV	PROC8b Dedicated Discharging to/from vessels
	Professional - SU22	Refuelling vehicles, light aircraft or marine	CS-I Refuelling - Concawe	Daily; >4 hours, to 100%	Pumped transfer to vehicle	No LEV	PROC8b Dedicated Discharging to/from vessels
Combine in narrative	Professional SU22	General use exposures as a fuel	CS15	Daily; >4 hours	Closed equipment	No LEV	PROC1 Use as a fuel
Combine in narrative	Professional SU22	General use exposures as a fuel	CS15	Daily; >4 hours	Closed equipment	No LEV	PROC2 Use as a fuel
	Professional - SU22	Use a fuel additive diluent	GES16, CS15 CS107	Daily; >4 hours, to 100%	Closed equipment	No LEV	PROC3 Closed batch process (with sampling)
	Professional SU22	Use a fuel	CES16, CS15 CS107	Daily; >4 hours, to 100%	Closed equipment	No LEV	PROC16 - use as a fuel
	Professional - SU22	Equipment maintenance e.g. Vehicle, boiler, pump maintenance,	CS39	Daily; >4 hours, to 100%	PPE. Operator training.	No LEV	PROC8a Discharging to/from vessels
	Professional SU22	Vessel / container cleaning	CS103	Daily; >4 hours, to 100%	vessel entry procedures, retain wash down in sealed storage pending disposal.	With LEV	PROC8a Discharging to/from vessels
	Professional SU22	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC1 Closed continuous process (sometimes with sampling)

A1.7.2 Use of Substance in Fuels – Professional

			Table 1: Mapp	oing Uses in the	Supply Chain	ı		Ti	able 2: Characte	erising the Ris	sk - High VP Liq	uids - Chemica	al Safety Asse	ssment - Evalua	ation of Safe Us	e
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor		Inhalatory exposure				Dem al exposure			
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	TRA Predicted Exposure (mg/m3) no modifiers	Inhalation RMM (efficiency)	Predicted Inhalation Exposure (mg/m3)	TRA Predicted Dermal Systemic Exposure (mg/kg/d) - no	TRA Predicted Dermal Local Exposure (mg/cm2/d) -	Dermal RMM (efficiency)	Predicted Systemic Dermal Exposure (mg/kg/d)	Predicted Local Dermal Exposure (mg/cm2/d) modified	Comments
Use as a fuel	8022	Bulk transfers (e.g. heating oil and diesel deliveries)	CS 14	Daily; 1-4 hour; ambient temp., Outdoors	Enclosed transfers, clear lines prior to decoupling	No LEV	PRO C8b Dedicated Discharging to/forn vessels	442.64		147.55	6.86	1		0.2	0.2	
Combine in narrative	Pintersional SUSE	Transfers from drums and containers	CS8	Daily; 15 mins - 1 hour; ambient temp	Pumped transfer from drum to equipment	No LEV	PRO C8b Dedicated Discharging to/from vessels	442.64		147.55	6.86	1		0.2	0.2	
	Profesolotei St/2	Refuelling vehicles, light aircraft or marine	CS-I Refuelling - Concave	Daily; >4 hours, to 100%	to vehicle	No LEV	PRO C8b Dedicated Discharging to/from vessels	442.64		147.55	6.86	1		0.2	0.2	
Combine in narrative	Pitries stotal S1/22	General use exposures as a fuel	CS 15	Daily; >4 hours	Closed equipment		PROC1 Use as a fuel	0.03		0.30	0.34	0.1		0.1	0.1	
Combine in narrative	Potesdatal SIZZ	General use exposures as a fuel	CS 15	Daily; >4 hours	Closed equipment	No LEV	PROC2 Use as a fuel	147.55		147.55	1.37	0.2		0.2	0.2	
	Potri data SUSS	Use a fuel additive diluent	GES 16, CS 15 CS 107	Daily; >4 hours, to 100%	Closed equipment	No LEV	PROC3 Closed batch process (with sampling)	295.09		206.56	0.34	0.1		0.1	0.1	
	Protections. 3022	Use a fuel	GES 16, CS 15 CS 107	Daily; >4 hours, to 100%	Closed equipment		PROC16 - use as a fuel	73.77		147.55	0.34	0.1		0.1	0.1	
	\$1422	Equipment maintenance e.g. Vehicle, boiler, pump maintenance,	CS 39	Daily; >4 hours, to 100%	training.	No LEV	PROC8a Discharging to/from vessels	737.73		29.51	13.71	1		0.2	0.2	
	Finder stone SU(2)	Vessel / container cleaning		Daily; >4 hours, to 100%	vessel entry procedures, retain wash down in sealed storage pending disposal.	With LEV	PROC8a Discharging to/from vessels	737.73		29.51	13.71	1		0.2	0.2	
	Profesolotei St/22	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC1 Closed continuous process (sometimes with sampling)	0.03		0.30	0.34	0.1		0.1	0.1	

A1.7.3 Use of Substance in Fuels - Professional

			Table 1: Mapp	ing Uses in the	Supply Chain	ı				
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor			
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Use as a fuel	Professional SU22	Bulk transfers (e.g. heating oil and diesel deliveries)	CS14	Daily; 1-4 hour; ambient temp., Outdoors	Enclosed transfers, clear lines prior to decoupling	No LEV	PROC8b Dedicated Discharging to/from vessels	0.049	0.002	0.051
Combine in narrative	Professional GU22	Transfers from drums and containers	CS8	Daily; 15 mins - 1 hour; ambient temp	Pumped transfer from drum to equipment	No LEV	PROC8b Dedicated Discharging to/from vessels	0.049	0.002	0.051
	Professional SU22	Refuelling vehicles, light aircraft or marine	CS-I Refuelling - Concawe	Daily; >4 hours, to 100%	Pumped transfer to vehicle	No LEV	PROC8b Dedicated Discharging to/from vessels	0.049	0.002	0.051
Combine in narrative	Professional SU22	General use exposures as a fuel	CS15	Daily; >4 hours	Closed equipment	No LEV	PROC1 Use as a fuel	0.000	0.001	0.001
Combine in narrative	Professional SU22	General use exposures as a fuel	CS15	Daily; >4 hours	Closed equipment	No LEV	PROC2 Use as a fuel	0.049	0.002	0.051
	Professional SU22	Use a fuel additive diluent	GES16, CS15 CS107	Daily; >4 hours, to 100%	Closed equipment	No LEV	PROC3 Closed batch process (with sampling)	0.069	0.001	0.070
	Professional SU22	Use a fuel	CES16, CS15 CS107	Daily; >4 hours, to 100%	Closed equipment	No LEV	PROC16 - use as a fuel	0.049	0.001	0.050
	Professional SU22	Equipment maintenance e.g. Vehicle, boiler, pump maintenance,	CS39	Daily; >4 hours, to 100%	PPE. Operator training.	No LEV	PROC8a Discharging to/from vessels	0.010	0.002	0.012
	Professional SU22	Vessel / container cleaning	CS103	Daily; >4 hours, to 100%	vessel entry procedures, retain wash down in sealed storage pending disposal.	With LEV	PROC8a Discharging to/from vessels	0.010	0.002	0.012
	Professional SU22	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC1 Closed continuous process (sometimes with sampling)	0.000	0.001	0.001

A1.8.1 Use of Substance in Fuels - Consumer - TRA

Table	1: Mapping Cor	nsumer Uses in the Su	pply Chain			Tabl	e 2a:	Characteri	sing the Risk - ba	sed on defau	Its (ECETOC	TRA Consun	ners)	
				all	all				all	d	0	i	i	i
Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels	Product ingredient	adult / child				frequency (events per day)	Skin surface contact area	Amount Swallowed (g)	Amount Used per event (g)	room volume (m3)	exposure time (hr)
Short Title	Area of Application / UD							Product is spray? (S)						
					d	o i								
Fuels	Çensumert-SU21		Liquid - subcategories added: Automotive Refuelling	0.5	i A	,			1	857.5		5000	20	4
Covers consumer uses in liquid fuels	Consumeri-SU21		Liquid - subcategories added: Scooter Refuelling	0.5	A	Į.			1	857.5		5000	20	4
PC13	Consumert-SU21		Liquid - subcategories added: Garden Equipment - Use	0.5	5	ļ.			1	857.5		5000	20	4
	Consumert-SU21	PC13:Fuels	Liquid (subcategories added): Garden Equipment - Refueling	0.5	i A	A			1	857.5		5000	20	4
		PC13:Fuels	Liquid (subcategories added): Home space heater fuel	0.5	i A	,			1	857.5		5000	20	4
	:Consumeri-SU21	PC13:Fuels	Liquid - subcategories added: Lamp oil	0.5	A	F			1	857.5		5000	20	4

TRA+

Table 1: N	Aapping Consu	mer Uses in the S	upply Chain										Table 2b: Char	acterising	the Risk	- after refi	nement of ex	posure estimate										
Constitution		Debrood the Confeet	Product sub Category	all .		al .		dermal		dermal		dernal		dermal			inhalation		inhalation		inhalation	inhalation		inhalation	inhalation		nhalation	
Generic Exposure Scenario Short Title	Area of Application / UD	Product	Product sub Category Sentiness	Product ingredient (weight fraction (a/d)		Frequency (events per day): if < 1, only used for chronic assessment		Skin surface contact area (cm2)		Use Dilution Factor		Dermal Factor		Glare effency	Amount Swalbwed (g)	RA-exposs	Amount Use per event (g)		Inhalation Fac total use spile i.e., and	ed/evapora/ed,	Location (indoos, outdoos, garage)	Air Exchange Rate (1/hr)		Okusion Factor incorporating Air Exchange Rose applied to TRA for miglig inhalation calc.	Room Volume (m2)		Exposure time (hours)	
Fuels	Country PSUCh	PC13Fuels	Liquid - subcategories added: Automotive Refuelling	1 00	increased above TRA default	0.5430	est as 1 perweek	Volue 210	est as paim of one hand	Value	Comments	0.0000100	Comments		Value	Comments	17500	Comments est. fuel tank size 50 L converts using gasoline-density of 750 kg/m3	0.0020	expect low to loss during refueling due to evaporation /spill	outdoor	0.6 0.6	est. conservative value for outdoor	0.9851	100.0	Comments Stoffermanag er volume used for outdoors	0.000	Smins, 97th percentile- Validatio et al. 1999
Covers consumer uses in liquid fuels	Occuments on	PC13:Fuels	Liquid - subcategories added: Scooter Refuelling	100	Increased above TRA default	0.5420	est. as 1 perweek	210	est, as paim of one hand			0.0000000					3750	est. Suif tank size 5 L converte using gesoline-density of 750 kg/m3	0.0200	expect low to loss during refueling but more than for automotive	outloor	0.6	est. conservative value for outdoor	0.9902	100.0	Stattenmanag er volume used for outdoors	0.033	2mins, Est. a shorter than vehicle
PC13	Occumentsi 24	PC12Fuels	Liquid - subcategories added: Garden Equipment - Use	1.00	Increased above TRA default	0.0700	est as 1 per two weeks										750	11: Corv from Lto g based upon density for mogas = 750 kg/m3.	0.0200	expect low % loss during equipment use	outdoor	0.6	est. conservative value for outdoor	0.5823	100.0	Stoffenmanag er volume used for outdoors	2.000	Est. 2 hours per day
	Groupes (SEE)	PC12Fuels	Liquid (subcategories added) Garden Equipment - Refueling	1.00	increased above TRA default	0.0700	est as 1 pertuo weeks	420	Est, half of each hand			0.0000000					750	11: Conv from Lt og based upon densky for mogas = 750 kg/m3.		exped low % loss but may be more from pouring than using filling station equipment	garage	1.5	RIVM general fact sheet	0.977B	34.0	R/I/M general fact sheet	0.090	Eat 2mins
		PC12Fuels	Liquid (subcategories added): Home space teater fuel	1.00	increased above TRA default	1,0000	est. as daily	210	est, as paim of one hand			0.0000050					3000	41: Conv from Lto g based upon density for magas = 750 kg/m3.	0.0013	exped low amount 6 ml max) splied during pouring in resistance	indoor, typical	0.6	RVM general fact sheet	0.9911	20.0	TRA default	0.000	Est. 2mins
	Occument (Or	PC12Fuels	Liquid - subcategories added: Lamp oil	1.00	increased above TRA default	0.1430	est. as 1 perweek	210	est as paim of one hand			0.0000006					100	0.13L: Conv from L tog based upon density for mogas. =750 k g/m3.	0.0500	expect low loss but % increased because lower use volume	indoor, typical	0.6	RNM general fact sheet	0.9961	20.0	TRA default	0.013	Eat 0.75 min

A1.8.2 Use of Substance in Fuels - Consumer

Tab	le 1: Mapping Consu	mer Uses in the Sup	oply Chain																
Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels														TRA+ Predicted	Exposure - includ (substance soe	ing RMM when needs
Short Title	Area of Application / UD			Indicator for Basis of Exposure Estimate	Concentratio n (weight fraction)	EFC1	amount of use (g)	EFC2	Glove Factor	EFC3	Amount swallowed (g)	EFC4	location	Air exchange rate	Room Volume (m3)	EFC6	Exposure		Predicted Inhalation Exposure (mg/m3)
																	d	0	
uels	Gonsulmen SU21	PC13:Fuels	Liquid - subcategories added: Automotive Refuelling	Based upon daily use													0.000350		1.539295
overs consumer ses in liquid fuels		PC13:Fuels	Liquid - subcategories added: Scooter Refuelling	Based upon daily use													0.000231		1.021108
C13	. ConsumeritSU2.1	PC13:Fuels	Liquid - subcategories added: Garden Equipment - Use	Based upon daily use															7.279227
		PC13:Fuels	Liquid (subcategories added): Garden Equipment - Refueling	Based upon daily use													0.000420		0.808870
		PC13:Fuels	Liquid (subcategories added): Home space heater fixel	Based upon daily use													0.000210		0.232278
	Consumert SU21	PC13:Fuels	Liquid - subcategories added: Lamp oil	Based upon daily													0.000091		0.134890

A1 8 3 Use of Substance in Fuels - Consumer

Table 1: N	Mapping Consumer l	Jses in the Supp	oly Chain					
Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels		Risk Characteriz	ation - including	RMMs when needed (s	substance Specific
Short Title	Area of Application / UD			Indicator for Basis of Exposure Estimate	RCR systemic (dermal, based on mg/kg/d))	RCR systemic (oral, based on mg/kg/d))	RCR systemic (inhalation based on mg/m3)	RCR systemic (all routes)
Fuels	GonsumerESU21	PC13:Fuels	Liquid - subcategories added: Automotive Refuelling	Based upon daily use	d 0.00000287	0	0.00358810	0.00359097
Covers consumer uses in liquid fuels	Consumer⊩8U21	PC13:Fuels	Liquid - subcategories added: Scooter Refuelling	Based upon daily use	0.00000189		0.00238020	0.00238210
PC13	Consumer SU21	PC13:Fuels	Liquid - subcategories added: Garden Equipment - Use	Based upon daily use			0.01696790	0.01696790
	ConsumerFSU21	PC13:Fuels	Liquid (subcategories added): Garden Equipment - Refueling	Based upon daily use	0.00000344		0.00188548	0.00188892
		PC13:Fuels	Liquid	Based upon daily	0.00000172		0.00054144	0.00054316
	Gonsumer⊩SU21	PC13:Fuels	Liquid - subcategories added: Lamp oil	Based upon daily use	0.00000075		0.00031443	0.00031517

A1.9.1 Use of Substance in Functional Fluids – Industrial

				ds – Industr ping Uses in the			
				Typical Mapped Operating	Typical Ma	oped RMMs	Use Descriptor
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent
Tunational fluids	homeon contract contract	D. II. to a set on	0044 00407	Daily 45 min 4	England	N- LEV	PROC1 Closed
Functional fluids	Industrial -SU10	Bulk transfers to/from storage	CS14, CS107	Daily; 15 min - 1 hour; ambient temp	Enclosed transfers, clear lines prior to decoupling	No LEV	continuous process (sometimes with sampling)
	Industrial -SU10	Bulk transfers to/from storage	CS14, CS107	Daily; 15 min - 1 hour; ambient temp	Enclosed transfers, clear lines prior to decoupling	No LEV	PROC2
10 and 50 checked and GESs revised	Industrial -SU10	Transfers from drums to filling machinery	CS8	Daily; 15 min - 1 hour; ambient temp	Pumped transfer from drum to holding tanks.	With LEV	PROC8b Discharging to/from vessels
	Industrial: -SU10	filling articles from predominantly enclosed machines	(CS53 delete), CS84, CS107	Daily; >4 hours, ambient	enclosed operations, size of openings minimised	With LEV	PROC9 Transfer of chemicals into small containers
	Industrial -SU10	manual filling of machines	CS45	Daily; 1-4 hours, ambient	careful pouring, worker instructions	With LEV	PROC8a Discharging to/from vessels (non-dedicated)
	Industrial -SU10	operation of closed equipment containing functional fluids	CS15	Daily; >4 hours, ambient	None.	With LEV	PROC2
Combine in narrative	Industrial -SU10	operation of open equipment containing functional fluids	CS16	Daily; >4 hours, ambient	Well ventilated area.	With LEV	PROC4 Use in batch and other process
elevated temperature	Industrial: -SU10	operation of open equipment containing functional fluids at elevated	CS16	Daily; >4 hours, ambient (product at 80oC)	None.	With LEV	PROC4 Use in batch and other process
elevated temperature	Industrial: -SU10	operation of open equipment containing functional fluids at elevated temperatures (aerosols)	CS16	Daily; >4 hours, ambient (product at 80oC)	None.	With LEV	PROC4 Use in batch and other process
	Industrial -SU10	Re-work on off specification articles	CS19	Daily; >4 hours, ambient	work methods, drain prior to work, retain spills	With LEV	PROC9 Transfer of chemicals into small containers
	Industrial -SU10	maintenance of equipment	CS5	Daily; 1-4 hours, ambient	work methods, drain prior to work, retain spills, gloves	With LEV	PROC8a Discharging to/from vessels (non-dedicated)
	Industrial -SU3	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC1 Closed continuous process (sometimes with sampling)
	Industrial -SU3	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC2 Closed continuous process (sometimes with sampling)

A1.9.2 Use of Substance in Functional Fluids – Industrial

			Table 1: Map	oing Uses in the	Supply Chain	ı		т	able 2: Charact	erising the Ris	sk - High VP Liq	uids - Chemica	al Safety Asse	ssment - Evalua	ation of Safe U	5 e
				Typical Mapped	Typical Ma	pped RMMs	Use Descriptor		Inhalatory exposure				Dem al exposure			
	User Group	Contributing Scenarios	CS Ref	Operating Conditions	Text	LEV	Process Category equivalent	TRA Predicted Exposure (mg/m3) no modifiers	Inhalation RMM (efficiency)	Predicted Inhalation Exposure (mg/m3) modified	TRA Predicted Dermal Systemic Exposure (mg/kg/d) - no modifiers	TRA Predicted Dermal Local Exposure (mg/cm2/d) - no modifiers	Dermal RMM (efficiency)	Predicted Systemic Dermal Exposure (mg/kg/d) modified	Predicted Local Dermal Exposure (mg/cm2/d) modified	Comm
inctional fluids	balstal (SUI)	Bulk transfers to/from storage	CS 14, CS 107	Daily; 15 min - 1 hour; ambient temp	Enclosed transfers, clear lines prior to decoupling	No LEV	PROC1 Closed continuous process (sometimes with sampling)	0.03		0.03	0.34	0.1		0.1	0.1	
	findustrieti -SU10.	Bulk transfers to/from storage	CS 14, CS 107	Daily; 15 min - 1 hour; ambient temp	Enclosed transfers, clear lines prior to decoupling	No LEV	PROC2	147.55		147.55	1.37	0.2		0.2	0.2	
and 50 ecked and ESs revised	jedustjeli -SUJO	Transfers from drums to filling machinery	CS8	Daily; 15 min - 1 hour; ambient temp	Pumped transfer from drum to holding tanks.	With LEV	PRO C8b Discharging to/from vessels	442.64		13.28	6.86	1		0.1	0.1	
	Industrial (31/10)	filling articles from predominantly enclosed machines	(CS53 delete), CS84, CS 107	Daily; >4 hours, ambient	enclosed operations, size of openings minimised	With LEV	PROC9 Transfer of chemicals into small containers	590.18		59.02	6.86	1		0.1	0.1	
	Industrial, SUIO	manual filling of machines	CS45	Daily; 1-4 hours, ambient	careful pouring, worker instructions	With LEV	PRO C8a Discharging to/from vessels (non-dedicated)	737.73		73.77	13.71	1		0.01	0.01	
	hdustrat (SUII):	operation of closed equipment containing functional fluids	CS 15	Daily; >4 hours, ambient	None.	With LEV	PROC2	147.55		147.55	1.37	0.2		0.2	0.2	
ombine in mative	hdukhiri SUN	operation of open equipment containing functional fluids	CS 16	Daily; >4 hours, ambient	Well ventilated area.	With LEV	PROC4 Use in batch and other process	295.09		29.51	6.86	1		0.1	0.1	
neted nperature	firalistrial -SU18	operation of open equipment containing functional fluids at	CS 16	Daily; >4 hours, ambient (product at 80oC)	None.	With LEV	PROC4 Use in batch and other process	295.09		29.51	6.86	1		0.1	0.1	
nated nperature	Industrial -SU18	operation of open equipment containing functional fluids at e le valte d temperatures (ae rosols)	CS 16	Daily; >4 hours, ambient (product at 80oC)	None.	With LEV	PROC4 Use in batch and other process	5.00	0	0.00	6.86	1	0	0	0	
	industrial -SU18	Re-work on off specification articles	CS 19	Daily; >4 hours, ambient	work methods, drain prior to work, retain spills	With LEV	PROC9 Transfer of chemicals into small containers	590.18		59.02	6.86	1		0.1	0.1	
	tindustriati - SU18.	maintenance of equipment	CS5	Daily; 1-4 hours, ambient	work methods, drain prior to work, retain spills, gloves	With LEV	PROC8a Discharging to/fom vessels (non-dedicated)	737.73		73.77	13.71	1		0.01	0.01	
	industriali -SUS	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC1 Closed continuous process (sometimes with sampling)	0.03		0.03	0.34	0.1		0.1	0.1	
	Industrial -SU3	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC2 Closed continuous process (sometimes with sampling)	147.55		147.55	1.37	0.2		0.2	0.2	

A1.9.3 Use of Substance in Functional Fluids – Industrial

			Table 1: Mapp	oing Uses in the	Supply Chain					
				Typical Mapped Operating	Typical Ma	pped RMMs	Use Descriptor			
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Functional fluids	s Industrial -SU10	Bulk transfers to/from storage	CS14, CS107	Daily; 15 min - 1 hour; ambient temp	Enclosed transfers, clear lines prior to decoupling	No LEV	PROC1 Closed continuous process (sometimes with sampling)	0.000	0.001	0.001
	Industrial: -SU10	Bulk transfers to/from storage	CS14, CS107	Daily; 15 min - 1 hour; ambient temp	Enclosed transfers, clear lines prior to decoupling	No LEV	PROC2	0.049	0.002	0.051
10 and 50 checked and GESs revised	Industrial -SU10	Transfers from drums to filling machinery	CS8	Daily; 15 min - 1 hour; ambient temp	Pumped transfer from drum to holding tanks.	With LEV	PROC8b Discharging to/from vessels	0.004	0.001	0.005
	industrial: -SU10	filling articles from predominantly enclosed machines	(CS53 delete), CS84, CS107	Daily; >4 hours, ambient	enclosed operations, size of openings minimised	With LEV	PROC9 Transfer of chemicals into small containers	0.020	0.001	0.021
	Industrial -SU10	manual filling of machines	CS45	Daily; 1-4 hours, ambient	careful pouring, worker instructions	With LEV	PROC8a Discharging to/from vessels (non-dedicated)	0.025	0.000	0.025
	Industrial -SU10	operation of closed equipment containing functional fluids	CS15	Daily; >4 hours, ambient	None.	With LEV	PROC2	0.049	0.002	0.051
Combine in narrative	Industrial -SU10	operation of open equipment containing functional fluids	CS16	Daily; >4 hours, ambient	Well ventilated area.	With LEV	PROC4 Use in batch and other process	0.010	0.001	0.011
elevated temperature	Industrial -SU10	operation of open equipment containing functional fluids at elevated	CS16	Daily; >4 hours, ambient (product at 80oC)	None.	With LEV	PROC4 Use in batch and other process	0.010	0.001	0.011
elevated temperature	Industrial: -5U10	operation of open equipment containing functional fluids at elevated temperatures (aerosols)	CS16	Daily; >4 hours, ambient (product at 80oC)	None.	With LEV	PROC4 Use in batch and other process	#DIV/0!	0.000	#DIV/0!
	industrial SU10	Re-work on off specification articles	CS19	Daily; >4 hours, ambient	work methods, drain prior to work, retain spills	With LEV	PROC9 Transfer of chemicals into small containers	0.020	0.001	0.021
	Industrial: -SU10	maintenance of equipment	CS5	Daily; 1-4 hours, ambient	work methods, drain prior to work, retain spills, gloves	With LEV	PROC8a Discharging to/from vessels (non-dedicated)	0.025	0.000	0.025
	Industrial -SU3	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC1 Closed continuous process (sometimes with sampling)	0.000	0.001	0.001
	Industrial -SU3	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC2 Closed continuous process (sometimes with sampling)	0.049	0.002	0.051

A1.10.1 Use of Substance in Functional Fluids - Professional

	Table 1: Mapping						
	User Group	Contributing Scenarios		Typical Mapped Operating	Typical Mapped RMMs		Use Descriptor
			CS Ref		Text	LEV	Process Category equivalent
Functional fluids	Professional - SU22	Transfers from drums to filling machinery	CS8	Daily; 15 min - 1 hour; ambient temp	Pumped transfer from drum to holding tanks.	With LEV	PROC8a Discharging to/from vessels (non-dedicated)
	Professional SU22	filling from small containers e.g. cans	CS22	Daily; >4 hours, ambient	enclosed operations, size of openings minimised, LEV to emission	With LEV	PROC9 Transfer of chemicals into small containers
	Professional - SU22	manual filling from drums	CS45	Daily; 1-4 hours, ambient	Pumped transfer from drum to article/machine	With LEV	PROC9 Transfer of chemicals into small containers
	Professional- SU22	operation of equipment containing functional fluids	CS15	Daily; >4 hours, ambient	None.	With LEV	PROC1
	Professional SU22	operation of equipment containing functional fluids	CS15	Daily; >4 hours, ambient	None.	With LEV	PROC2 Closed continuous process (sometimes with sampling)
	Professional SU22	operation of equipment containing functional fluids	CS15	Daily; >4 hours, ambient	None.	With LEV	PROC3
Combine in narrative	Professional- SU22	operation of equipment containing functional fluids	CS16	Daily; >4 hours, ambient	None	With LEV	PROC20 Heat and pressure transfer fluids (closed systems)
	Professional - SU22	operation of equipment containing functional fluids at elevated	CS16	Daily; >4 hours, ambient (product at 80oC)	None.	With LEV	PROC20 Heat and pressure transfer fluids (closed systems)
	Professional SU22	Re-work on off specification articles	CS19	Daily; 1-4 hours, ambient	work methods, drain prior to work, retain spills	With LEV	PROC9 - Transfer of chemicals into small containers
	Professional - SU22	maintenance of equipment	CS5	Daily; 1-4 hours, ambient	work methods, drain prior to work, retain spills, gloves	No LEV	PROC8a Discharging to/from vessels (non-dedicated)
	Professional SU22	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC1 Closed continuous process (sometimes with sampling)
	Professional - SU22	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC2 Closed continuous process (sometimes with sampling)

A1.10.2 Use of Substance in Functional Fluids – Professional

	Table 1: Mapping							Т	able 2: Charact	terising the Ri	sk - High VP Liq	uids - Chemica	al Safety Asse	ssment - Evalu	ation of Safe Us	se
	User Group	Contributing Scenarios		Typical Mapped Operating	Typical Mapped RMMs		Use Descriptor		Inhalatory exposure	,			Dem al exposure			
		Ottleios	CS Ref		Text	LEV	Process Category equivalent	TRA Predicted Exposure (mg/m3) no modifiers	Inhalation RMM (efficiency)	Predicted Inhalation Exposure (mg/m3)	TRA Predicted Dermal Systemic Exposure (mg/kg/d) - no	TRA Predicted Dermal Local Exposure (mg/cm2/d) -	Dermal RMM (efficiency)	Predicted Systemic Dermal Exposure (mg/kg/d)	Predicted Local Dermal Exposure (mg/cm2/d) modified	Comments
nctional fluids	Professional SUSS	Transfers from drums to filling machinery	CS8	Daily; 15 min - 1 hour; ambient temp	Pumped transfer from drum to holding tanks.	With LEV	PROC8a Discharging to/from vessels (non-dedicated)	737.73		59.02	13.71	1		0.01	0.01	
	Philes sloha SUS2	filing from small containers e.g. cans	CS22	Daily; >4 hours, ambient	enclosed operations, size of openings minimised, LEV to emission	With LEV	PROC9 Transfer of chemicals into small containers	590.18		147.55	6.86	1		0.2	0.2	
	Professional SU22	manual filling from drums	CS45	Daily; 1-4 hours, ambient	Pumped transfer from drum to article/machine	With LEV	PROC9 Transfer of chemicals into small containers	590.18		147.55	6.86	1		0.2	0.2	
	Protestrant SUCC	operation of equipment containing functional fluids	CS 15	Daily; >4 hours, ambient	None.	With LEV	PROC1	0.03		0.30	0.34	0.1		0.1	0.1	
	Potesoon 302	operation of equipment containing functional fluids	CS 15	Daily; >4 hours, ambient	None.	With LEV	PROC2 Closed continuous process (sometimes with sampling)	147.55		147.55	1.37	0.2		0.2	0.2	
	Problems SU22	operation of equipment containing functional fluids	CS 15	Daily; >4 hours, ambient	None.	With LEV	PROC3	295.09		206.56	0.34	0.1		0.1	0.1	
tbine in stive	Probudina 6U23	operation of equipment containing functional fluids	CS 16	ambient	None	With LEV	PRO C20 Heat and pressure transfer fluids (closed systems)	0.30		147.55	0.34	0.1		0.25	0.25	
	Professional SUE2	operation of equipment containing functional fluids at elevated	CS 16	Daily; >4 hours, ambient (product at 80oC)	None.	With LEV	PROC20 Heat and pressure transfer fluids (closed systems)	0.30		147.55	0.34	0.1		0.25	0.25	
	Pintersional SUSE	Re-work on off specification articles	CS 19	Daily; 1-4 hours, ambient	work methods, drain prior to work, retain spills	With LEV	PROC9 - Transfer of chemicals into small containers	590.18		221.32	6.86	1		0.2	0.2	
	Profesional SUCC	maintenance of equipment	CS5	Daily; 1-4 hours, ambient	work methods, drain prior to work, retain spills, gloves	No LEV	PRO C8a Discharging to/from vessels (non-dedicated)	737.73		206.56	13.71	1		0.2	0.2	
	Protebucher SUG2	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC1 Closed continuous process (sometimes with sampling)	0.03		0.30	0.34	0.1		0.1	0.1	
	Professional 0U23	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC2 Closed continuous process (sometimes with sampling)	147.55		147.55	1.37	0.2		0.2	0.2	

A1.10.3 Use of Substance in Functional Fluids - Professional

	Mapping			Toring Man	Toring Man		Line December			
	User Group	Contributing Scenarios		Typical Mapped Operating	Typical Mapped RMMs		Use Descriptor			
			CS Ref		Text	LEV	Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCI (all routes)
unctional fluid	Protessional SU22	Transfers from drums to filling machinery	CS8	Daily; 15 min - 1 hour; ambient temp	Pumped transfer from drum to holding tanks.	With LEV	PROC8a Discharging to/from vessels (non-dedicated)	0.020	0.000	0.020
	Protessional SU22	filling from small containers e.g. cans	CS22	Daily; >4 hours, ambient	enclosed operations, size of openings minimised, LEV to emission	With LEV	PROC9 Transfer of chemicals into small containers	0.049	0.002	0.051
	Professional SU22	manual filling from drums	CS45	Daily; 1-4 hours, ambient	Pumped transfer from drum to article/machine	With LEV	PROC9 Transfer of chemicals into small containers	0.049	0.002	0.051
	Professional SU22	operation of equipment containing functional fluids	CS15	Daily; >4 hours, ambient	None.	With LEV	PROC1	0.000	0.001	0.001
	Professional SU22	operation of equipment containing functional fluids	CS15	Daily; >4 hours, ambient	None.	With LEV	PROC2 Closed continuous process (sometimes with sampling)	0.049	0.002	0.051
	Professional 9022	operation of equipment containing functional fluids	CS15	Daily; >4 hours, ambient	None.	With LEV	PROC3	0.069	0.001	0.070
ombine in rrative	Professional SU22	operation of equipment containing functional fluids	CS16	Daily; >4 hours, ambient	None	With LEV	PROC20 Heat and pressure transfer fluids (closed systems)	0.049	0.003	0.052
	Professional SU22	operation of equipment containing functional fluids at elevated	CS16	Daily; >4 hours, ambient (product at 80oC)	None.	With LEV	PROC20 Heat and pressure transfer fluids (closed systems)	0.049	0.003	0.052
	Professional SU22	Re-work on off specification articles	CS19	Daily; 1-4 hours, ambient	work methods, drain prior to work, retain spills	With LEV	PROC9 - Transfer of chemicals into small containers	0.074	0.002	0.076
	Professional SU22	maintenance of equipment	CS5	Daily; 1-4 hours, ambient	work methods, drain prior to work, retain spills, gloves	No LEV	PROC8a Discharging to/from vessels (non-dedicated)	0.069	0.002	0.071
	Protessional SU22	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC1 Closed continuous process (sometimes with sampling)	0.000	0.001	0.001
	Professional SU22	Storage	CS67	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC2 Closed continuous process (sometimes with sampling)	0.049	0.002	0.051

A1.11.1 Use of Substance in Laboratory Applications – Industrial

No environmental mapping

A1.11.2 Use of Substance in Laboratory Applications – Industrial No environmental mapping

A1.11.2 Use of Substance in Laboratory Applications – Industrial

No environmental mapping

A1.12.1 Use of Substance in Laboratory Applications – Industrial

			Table 1: Mapp	oing Uses in the	Supply Chain		
				Typical Mapped Operating	Typical Map	pped RMMs	Use Descriptor
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent
Use in	Industrial - SU3	CC26 Laboratory	CS36	Continuous dailu	Cumo cumboard or	Vec	PROC15
laboratories	8: etc	CS36 Laboratory activities	C330	> 4 hour; ambient temp.	Fume cupboard or ventilated glove- box; Bench- mounted local extract	i es	PROCIS
	Industrial - SU3, 8, etc	CS47 Cleaning [wiping, brushing, flushing]	CS47	Continuous; daily; 15 min - 1 hour/d; ambient temp.	Fume cupboard or ventilated glove- box; Bench- mounted local extract	Yes	PROC10

A1.12.2 Use of Substance in Laboratory Applications – Industrial

	Table 1: Mapping Uses in the Supply Chain						Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use						e			
			Typical Mapped Operating	Typical Mag	Typical Mapped RMMs Use Descriptor			Inhalatory exposure			Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	TRA Predicted Exposure (mg/m3) no modifiers	Inhalation RMM (efficiency)	Predicted Inhalation Exposure (mg/m3)	TRA Predicted Dermal Systemic Exposure (mg/kg/d) - no	TRA Predicted Dermal Local Exposure (mg/cm2/d) -	Dermal RMM (efficiency)	Predicted Systemic Dermal Exposure (mg/kg/d)	Predicted Local Dermal Exposure (mg/cm2/d) modified	Comments
Use in laboratories	(stps)(st-SU3; 8, etc.	activities		> 4 hour, ambient temp.	box; Bench- mounted local extract		PROC15	147.55		147.55	0.34	0.1		0.1	0.1	
	industrial - SLO. 3. étő		CS 47	15 min - 1 hour/d; ambient temp.	Fume cupboard or ventilated glove- box; Bench- mounted local extract	Yes	PROC10	737.73		73.77	27.43	2	0	0.1	0.1	

A1.12.3 Use of Substance in Laboratory Applications - Industrial

				Typical Mapped Operating		oped RMMs	Use Descriptor			
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
se in boratories	8. etc.	CS36 Laboratory activities	CS36	> 4 hour; ambient temp.	box; Bench- mounted local extract		PROC15	0.049	0.001	0.050
	8. etrá	CS47 Cleaning [wiping, brushing, flushing]	CS47	Continuous; daily; 15 min - 1 hour/d; ambient temp.	Fume cupboard or ventilated glove- box; Bench- mounted local extract	Yes	PROC10	0.025	0.001	0.026

A1.13.1 Use of Substance in Laboratory Applications – Professional

			Table 1: Map	ping Uses in the	Supply Chain		
				Typical Mapped Operating	Typical Map	pped RMMs	Use Descriptor
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent
Use in	Professional -	CS36 Laboratory	CS36	Continuous: daily:	Fume cupboard or	With LEV	PROC15
laboratories	SU22	activities		> 4 hour; ambient temp.		vviai EE v	. Noois
	Professional - SU22	CS47 Cleaning [wiping, brushing, flushing]	CS47	Continuous; daily; 15 min - 1 hour/d; ambient temp.	Fume cupboard or ventilated glove- box; Bench- mounted local extract	Without LEV	PROC10

A1.13.2 Use of Substance in Laboratory Applications – Professional

	Table 1: Mapping Uses in the Supply Chain						т	able 2: Charact	erising the Ri	sk - High VP Liq	uids - Chemic	al Safety Asse	ssment - Evalu	ation of Safe Us	se	
				Typical Mapped Operating			Inhalatory exposure					Demal exposure	!			
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	TRA Predicted Exposure (mg/m3) no modifiers	Inhalation RMM (efficiency)	Predicted Inhalation Exposure (mg/m3)	TRA Predicted Dermal Systemic Exposure (mg/kg/d) - no	TRA Predicted Dermal Local Exposure (mg/cm2/d) -	Dermal RMM (efficiency)	Predicted Systemic Dermal Exposure (mg/kg/d)	Predicted Local Dermal Exposure (mg/cm2/d) modified	Comment
in oratories	Professional S1422		CS 36	Continuous; daily; > 4 hour; ambient temp.		With LEV	PROC15	147.55		147.55	0.34	0.1		0.1	0.1	
	Profesional S1422	[wiping, brushing, flushing]	CS 47	Continuous; daily; 15 min - 1 hour/d; ambient temp.		Without LEV	PROC10	737.73		88.53	27.43	2	0	0.1	0.1	

A1.13.3 Use of Substance in Laboratory Applications – Professional

				Typical Mapped Operating		Typical Mapped RMMs Us				
	User Group	Contributing Scenarios	CS Ref	Conditions	Text	LEV	Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Use in laboratories	Professional - SU22	CS36 Laboratory activities	CS36	> 4 hour; ambient temp.	box; Bench- mounted local extract	With LEV	PROC15	0.049	0.001	0.050
	Professional - SU22	CS47 Cleaning [wiping, brushing, flushing]	CS47	Continuous; daily; 15 min - 1 hour/d; ambient temp.	Fume cupboard or ventilated glove- box; Bench- mounted local extract	Without LEV	PROC10	0.030	0.001	0.031

APPENDIX B – QUALITATIVE RISK ASSESSMENT OF RISKS FROM FLAMMABLE SUBSTANCES

The accident scenarios relevant for REACH are minor accidents which might occur in the workplace and those related to consumer use. Major accidents caused by chemicals and the requirements to manage these risks are regulated under the Seveso II Directive and do not need to be considered.

Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures tailored to each specific risk. For flammable substances the following measures need to be implemented to control the risks and to show that safe use can be accomplished. For all flammable substances classified as R10, R11 or R12 (H220, H221, H224, H225, H226), safety data sheets should be made available in which the appropriate risk management measures are identified and communicated. Primary means of communication with the consumer is through the label.

Physicochemical Hazard Qualitative Risk Assessment

The regulatory framework for managing the risk arising from flammable materials is highly developed. The regulatory framework should be fully complied with and is sufficient to prevent minor accidents which occur at the workplace or during consumer use. Additional measures such as those shown below or those highlighted in the "check questionnaire for identifying accident risk factors due to physiochemical properties in the "Guidance on information requirements and chemical safety assessment – Part E: Risk Characterisation" or their equivalent should be implemented to further control this risk. -

Hazard	Material	Risk / Hazard Phrase	P Phrase	Qualitative Risk Assessment
Extremely Flammable	• Gas	 R12 / H220 (Extremely flammable gas) R12 / H221 (Flammable gas) 	Prevention: P210: Keep away from heat/sparks/open flames/ /hot surfaces No smoking. Response P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381: Eliminate all ignition sources if safe to do so.	Electrostatic discharge may cause fire (Industrial) Ensure electrical continuity by bonding and grounding (earthing) all equipment. (Industrial / Professional). . Do NOT use compressed air for filling, discharging or handling operations (Industrial). Electrostatic charges may be generated during pumping. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge.(industrial) If positive displacement pumps are used, these must be fitted with a non-integral pressure relief valve (Industrial).
			Storage: • P403: Store in a well-ventilated place.	 Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks (Industrial/ Professional). The vapour is heavier than air, spreads along the ground and

Hazard	Material	Risk / Hazard Phrase	P Phrase	Qualitative Risk Assessment
				distant ignition is possible (Industrial).
				Substance Avoid Overfilling (Industrial/ Professional). Use appropriate equipment for filling IBCs and other containers. IBCs and other containers must be constructed of appropriate material) (Industrial). Handle and open container with care in a well-ventilated area (Industrial/ Professional). Use only with adequate ventilation (Consumer). Do NOT empty into drains (Industrial/ Professional). Oxidising Agents Keep away from oxidising agents (Industrial/ Professional).
Extremely Flammable	• Liquid	R12 / H224 (Extremely flammable liquid and vapour)	Prevention: P210: Keep away from heat/sparks/open flames/ /hot surfaces No smoking P233 Keep container tightly closed. P240: Ground/bond container and receiving equipment. P241: Use explosion-proof electrical/ventilating/lighting// equipment. P242: Use only non-sparking tools. P243: Take precautionary measures against static discharge. P280: Wear protective gloves/eye protection/face protection.	Risks arising from Flammability Classification Source of Ignition • Electrostatic discharge may cause fire (Industrial) • Ensure electrical continuity by bonding and grounding (earthing) all equipment. (Industrial / Professional). • .Do NOT use compressed air for filling, discharging or handling operations (Industrial). • Electrostatic charges may be generated during pumping. • Restrict line velocity during pumping in order to avoid generation of electrostatic discharge.(industrial) • If positive displacement pumps are used, these must be fitted with a non-integral pressure relief valve (Industrial). • Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks (Industrial/ Professional). • The vapour is heavier than air, spreads along the ground and distant ignition is possible (Industrial).
			Response: • P303 + P361 + P353 : IF ON SKIN (or hair): Remove/Take off	Substance • Avoid Overfilling (Industrial/ Professional).

Hazard	Material	Risk / Hazard Phrase	P Phrase	Qualitative Risk Assessment
			immediately all contaminated clothing. Rinse skin with water/shower P370 + P378 : In case of fire: Use for extinction. Storage: P403 + P235 : Store in a well-ventilated place. Keep cool. P501 : Dispose of contents/container to	Use appropriate equipment for filling IBCs and other containers. IBCs and other containers must be constructed of appropriate material) (Industrial). Handle and open container with care in a well-ventilated area (Industrial/ Professional). Do NOT empty into drains (Industrial/ Professional). Oxidising Agents Keep away from oxidising agents (Industrial/ Professional).
Highly Flammable	• Liquid	R11 / H224 (Extremely flammable liquid and vapour) R11 / H225 (Highly flammable liquid and vapour)	Prevention: P210: Keep away from heat/sparks/open flames/ /hot surfaces No smoking P233 Keep container tightly closed. P240: Ground/bond container and receiving equipment. P241: Use explosion-proof electrical/ventilating/lighting// equipment. P242: Use only non-sparking tools. P243: Take precautionary measures against static discharge. P280: Wear protective gloves/eye protection/face protection.	Risks arising from Flammability Classification Source of Ignition • Electrostatic discharge may cause fire (Industrial) • Ensure electrical continuity by bonding and grounding (earthing) all equipment. (Industrial / Professional). • Do NOT use compressed air for filling, discharging or handling operations (Industrial). • Electrostatic charges may be generated during pumping. • Restrict line velocity during pumping in order to avoid generation of electrostatic discharge.(industrial) • If positive displacement pumps are used, these must be fitted with a non-integral pressure relief valve (Industrial). • Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks (Industrial/ Professional). • The vapour is heavier than air, spreads along the ground and distant ignition is possible (Industrial).
			Response: P303 + P361 + P353 : IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower P370 + P378 : In case of fire:	Avoid Overfilling (Industrial/ Professional). Use appropriate equipment for filling IBCs and other containers. IBCs and other containers must be constructed of appropriate material) (Industrial). Handle and open container with care in a well-ventilated area

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Hazard	Material	Risk / Hazard Phrase	P Phrase	Qualitative Risk Assessment
			Use for extinction. Storage: P403 + P235 : Store in a well-ventilated place. Keep cool. P501 : Dispose of contents/container to	(Industrial/ Professional). • Do NOT empty into drains (Industrial/ Professional). Oxidising Agents Keep away from oxidising agents (Industrial/ Professional).
Flammable	• Liquid	 R10 / H225 (Highly flammable liquid and vapour) R10 / H226 (Flammable liquid and vapour) 	 Prevention: P210: Keep away from heat/sparks/open flames/ /hot surfaces No smoking P233 Keep container tightly closed. P240: Ground/bond container and receiving equipment. P241: Use explosion-proof electrical/ventilating/lighting// equipment. P242: Use only non-sparking tools. P243: Take precautionary measures against static discharge. P280: Wear protective gloves/eye protection/face protection. 	 Source of Ignition Electrostatic discharge may cause fire (Industrial) Ensure electrical continuity by bonding and grounding (earthing) all equipment. (Industrial / Professional). Do NOT use compressed air for filling, discharging or handling operations (Industrial). Electrostatic charges may be generated during pumping. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge. (industrial If positive displacement pumps are used, these must be fitted with a non-integral pressure relief valve (Industrial). Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks (Industrial/ Professional). The vapour is heavier than air, spreads along the ground and distant ignition is possible (Industrial).
			Response: P303 + P361 + P353 : IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower P370 + P378 : In case of fire: Use for extinction. Storage: P403 + P235 : Store in a well-ventilated place. Keep cool.	 Substance Avoid Overfilling (Industrial/ Professional). Use appropriate equipment for filling IBCs and other containers. IBCs and other containers must be constructed of appropriate material) (Industrial). Handle and open container with care in a well-ventilated area (Industrial/ Professional). Use only with adequate ventilation (Consumer). Do NOT empty into drains (Industrial/ Professional).

EC number: 201-142-8

2-methylbutane - HSRC

CAS number: 78-78-4

Hazard	Material	Risk / Hazard Phrase	P Phrase	Qualitative Risk Assessment
			P501 : Dispose of contents/container to	Oxidising Agents Keep away from oxidising agents (Industrial/ Professional).