SAFETY DATA SHEET

Annex II

Exposure scenario

Substance Name: pentane

EC Number: 203-692-4

CAS Number: 109-66-0

Contents

1. EXPOSURE ASSESSMENT

ES number	Volume (EU tonnes per year per use)	Manufacture	Identified uses			Resulting life cycle stage		Linked to Identified Use	Sector of Use (SU)	Preparation Category (PC)	Process category (PROC)	Article category (AC)	Environmental Release Category (ERC)
			Formulation	End use	Consumer use	Service life (for articles)	Waste stage						
ES 1	2.16E+05	X						01	3, 8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	NA	1, 4
ES 2	3.60E+04	X						01a	3	NA	1, 2, 3, 4, 8a, 8b, 9, 15	NA	1, 2, 3, 4, 5, 6, 7
ES 3	3.40E+04		X					02	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	NA	2
ES 4	2.10E+01			X				03a	3	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15	NA	4
ES 5	1.00E+01				X			03c	21	1, 4, 8 (excipient only), 9, 15, 18, 23, 24, 31, 34	NA	NA	8a, 8d
ES 6	7.50E+01			X				04a	3	NA	2, 3, 4, 7, 8a, 8b, 10, 13	NA	4
ES 7	7.50E+01			X				04b	22	NA	2, 3, 4, 8a, 8b, 10, 11, 13	NA	8a, 8d
ES 8	4.15E+02				X			04c	21	3, 4, 8 (excipient only), 9, 24, 35, 38	NA	NA	8a, 8d

ES number	Volume (EU tonnes per year per use)	Manufacture	Identified uses			Resulting life cycle stage		Linked to Identified Use	Sector of Use (SU)	Preparation Category (PC)	Process category (PROC)	Article category (AC)	Environmental Release Category (ERC)
			Formulation	End use	Consumer use	Service life (for articles)	Waste stage						
ES 9	1.46E+04			X				09	3	NA	1, 2, 3, 8b, 9, 12	NA	4
ES 10	1.00E+02			X				11a	22	NA	1, 2, 4, 8a, 8b, 11, 13	NA	8a, 8d
ES 11	4.00E+01			X				12a	3	NA	1, 2, 3, 8a, 8b, 16	NA	7
ES 12	1.00E+02			X				12b	22	NA	1, 2, 3, 8a, 8b, 16	NA	9a, 9b
ES 13	7.23E+03				X			12c	21	13	NA	NA	9a, 9b
ES 14	9.21E+04			X				13a	3	NA	1, 2, 3, 4, 8a, 8b, 9	NA	7
ES 15	5.00E+02			X				13b	22	NA	1, 2, 3, 8a, 9, 20	NA	9a, 9b
ES 16	1.62E+03				X			16	21	28, 39	NA	NA	8a, 8d
ES 17	5.00E+01			X				17a	3	NA	10, 15	NA	2, 4
ES 18	5.01E+01			X				17b	22	NA	10, 15	NA	8a

1.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Manufacture of Substance – Industrial GES1.1	
Use Descriptor	
Sector(s) of Use	3
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 Category	ESVOC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]

Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions (*only required controls to demonstrate safe use listed*)**
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] PROC8b	No specific measures identified[EI18]
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]
Bulk transfers [CS14](open systems) [CS108] PROC8b	No specific measures identified[EI18]
Bulk transfers [CS14](closed systems) [CS107] PROC8b	No specific measures identified[EI18]
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]
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 exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	22000
Fraction of Regional tonnage used locally [A3]	1
Annual site tonnage (tonnes/year) [A5]	22000
Maximum daily site tonnage (kg/day) [A4]	72000
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.005
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.0003
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [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 (%) [TCR7]	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	7.5
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	2200000
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
Section 3 Exposure Estimation	
3.1. Health	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	

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
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

Exposure Estimation:
Human Health
See Appendix 2.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 GES1A.1	
Use Descriptor	
Sector(s) of Use	3
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	
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.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions (*only required controls to demonstrate safe use listed*)**
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[EI18]
Drum and small package filling [CS6] PROC9	No specific measures identified[EI18]
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]

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 exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	3600
Fraction of Regional tonnage used locally [A3]	0.002
Annual site tonnage (tonnes/year) [A5]	7.2
Maximum daily site tonnage (kg/day) [A4]	360
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.0001
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.00001
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	13000000
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
Section 3 Exposure Estimation	
3.1. Health	

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]
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
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

Exposure Estimation:
Human Health
See Appendix 2.a.
Environment
See PETRORISK file (Annex III)..

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

1.3.1Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Formulation & (Re)packing of Substances and Mixtures – Industrial GES2.1	
Use Descriptor	
Sector(s) of Use	3
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 substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletization, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
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]
Batch processes at elevated temperatures [CS136]Operation is carried out at elevated temperature (> then 20°C above ambient temperature) [OC7] PROC3	Provide enhanced mechanical ventilation by mechanical means [E48]
Process sampling [CS2] PROC3	No specific measures identified[EI18]
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]
Bulk transfers [CS14] PROC8b	No specific measures identified[EI18]
Mixing operations (open systems) [CS30] PROC5	No specific measures identified[EI18]
Manual [CS34]Transfer from/pouring from containers	No specific measures identified[EI18]

[CS22] PROC8a	
Drum/batch transfers [CS8] PROC8b	No specific measures identified[EI18]
Production or preparation or articles by tabletting, compression, extrusion or pelletisation [CS100] PROC14	No specific measures identified[EI18]
Drum and small package filling [CS6] PROC9	No specific measures identified[EI18]
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]
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 exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	3400
Fraction of Regional tonnage used locally [A3]	1
Annual site tonnage (tonnes/year) [A5]	3400
Maximum daily site tonnage (kg/day) [A4]	11000
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (after typical onsite RMMs, consistent with EU Solvent Emissions Directive requirements) [OOC11]	0.025
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.0002
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	650000
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
Section 3 Exposure Estimation	
3.1. Health	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
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	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].	

Exposure Estimation:
Human Health
See Appendix 2.a.
Environment
See PETRORISK file (Annex III)..

1.4 Uses in Coatings – Industrial

1.4.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Uses in Coatings – Industrial GES3.1	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 4, 5, 7, 8a, 8b, 10, 13, 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
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 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
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[EI18]
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	Provide enhanced mechanical ventilation by mechanical means [E48]
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]
Preparation of material for application [CS96]Mixing	No specific measures identified[EI18]

operations (open systems) [CS30] PROC5	
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] 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]
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 allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	2.1
Fraction of Regional tonnage used locally [A3]	1
Annual site tonnage (tonnes/year) [A5]	2.1
Maximum daily site tonnage (kg/day) [A4]	110
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.098
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.0007
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	90

Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	190000
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
Section 3 Exposure Estimation	
3.1. Health	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
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	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].	

Exposure Estimation:
Human Health
See Appendix 2.a.
Environment
See PETRORISK file (Annex III)..

9.5 Uses in Coatings – Consumer

9.5.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Uses in Coatings – Consumer GES3.3	
Use Descriptor	
Sector(s) of Use	21
Product Categories	1, 4, 8 (excipient only), 9, 15, 18, 23, 24, 31, 34 *Further information on the mapping and allocation of PC codes is contained in Appendix 1.b.*
Environmental Release Categories	8a, 8d
Specific Environmental Release Category	ESVOC 8.3c.v1
Processes, tasks, activities covered	
Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of consumer exposure	
Product characteristics	
Physical form of product	liquid
Vapour pressure	56.3 kPa
Concentration of substance in product	Unless otherwise stated, cover concentrations up to 100% [ConsOC1]
Amounts used	Unless otherwise stated, covers use amounts up to13800g [ConsOC2]; covers skin contact area up to 857.5cm2 [ConsOC5]
Frequency and duration of use/exposure	Unless otherwise stated, covers use frequency up to 1 times per day [ConsOC4]; covers exposure up to 6 hours per event [ConsOC14]
Other Operational Conditions affecting exposure	Unless otherwise stated assumes use at ambient temperatures [ConsOC15]; assumes use in a 20 m3 room [ConsOC11]; assumes use with typical ventilation [ConsOC8].
Product Category	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
PC1:Adhesives, sealants--Glues, hobby use	Unless otherwise stated, covers concentrations up to 30% [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 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 9g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC1:Adhesives, sealants--Glues DIY-use (carpet glue, tile glue, wood parquet glue)	Unless otherwise stated, covers concentrations up to 30% [ConsOC1]; covers use up to 1 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 110.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 6390g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 6.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC1:Adhesives, sealants--Glue from spray	Unless otherwise stated, covers concentrations up to 30% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 85.05g [ConsOC2]; covers use under

	typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC1:Adhesives, sealants--Sealants	Unless otherwise stated, covers concentrations up to 30% [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 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 75g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 1.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products--Washing car window	Unless otherwise stated, covers concentrations up to 1% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 0.5g [ConsOC2]; Covers use in a one car garage (34m3) under typcial ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.02hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products--Pouring into radiator	Unless otherwise stated, covers concentrations up to 10% [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 428.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 2000g [ConsOC2]; Covers use in a one car garage (34m3) under typcial ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products--Lock de-icer	Unless otherwise stated, covers concentrations up to 50% [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 214.40 cm2 [ConsOC5]; for each use event, covers use amounts up to 4g [ConsOC2]; Covers use in a one car garage (34m3) under typcial ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.25hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC8_n: Biocidal products (excipient use only for solvent products)--Laundry and dish washing products	Unless otherwise stated, covers concentrations up to 5% [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 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 15g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.50hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC8_n: Biocidal products (excipient use only for solvent products)--Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal	Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 27g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to

cleaners)	0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC8_n: Biocidal products (excipient use only for solvent products)--Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Unless otherwise stated, covers concentrations up to 15% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 35g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners--Waterborne latex wall paint	Unless otherwise stated, covers concentrations up to 1.5% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 2760g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners--Solvent rich, high solid, water borne paint	Unless otherwise stated, covers concentrations up to 27.5% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 744g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners--Aerosol spray can	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 2 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 215g [ConsOC2]; Covers use in a one car garage (34m3) under typcial ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners--Removers (paint-, glue-, wall paper-, sealant-remover)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 3 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 491g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay--Fillers and putty	Unless otherwise stated, covers concentrations up to 2% [ConsOC1]; covers use up to 12 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 85g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated

PC9b:Fillers, putties, plasters, modeling clay--Plasters and floor equalizers	Unless otherwise stated, covers concentrations up to 2% [ConsOC1]; covers use up to 12 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 13800g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay--Modelling clay	Unless otherwise stated, covers concentrations up to 1% [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 254.40 cm2 [ConsOC5]; for each use event, assumes swallowed amount of 1g [ConsOC13];
	No specific RMMs identified beyond those OCs stated
PC9c:Finger paints --Finger paints	Unless otherwise stated, covers concentrations up to 50% [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 254.40 cm2 [ConsOC5]; for each use event, assumes swallowed amount of 1.35g [ConsOC13];
	No specific RMMs identified beyond those OCs stated
PC15_n: Non-metal surface treatment products--Waterborne latex wall paint	Unless otherwise stated, covers concentrations up to 1.5% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 2760g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC15_n: Non-metal surface treatment products--Solvent rich, high solid, water borne paint	Unless otherwise stated, covers concentrations up to 27.5% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 744g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC15_n: Non-metal surface treatment products--Aerosol spray can	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 2 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 215g [ConsOC2]; Covers use in a one car garage (34m3) under typcial ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC15_n: Non-metal surface treatment products--Removers (paint-, glue-, wall paper-, sealant-remover)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 3 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 491g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];

	No specific RMMs identified beyond those OCs stated
PC18_n: Ink and toners--Inks and toners.	Unless otherwise stated, covers concentrations up to 10% [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 71.40 cm2 [ConsOC5]; for each use event, covers use amounts up to 40g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC23_n: Leather tanning, dye, finishing, impregnation and care products--Polishes, wax / cream (floor, furniture, shoes)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 29 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 430.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 56g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 1.23hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC23_n: Leather tanning, dye, finishing, impregnation and care products--Polishes, spray (furniture, shoes)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 8 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 430.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 56g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Liquids	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 468.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 2200g [ConsOC2]; Covers use in a one car garage (34m3) under typcial ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Pastes	Unless otherwise stated, covers concentrations up to 20% [ConsOC1]; covers use up to 10 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 468.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 34g [ConsOC2];
	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Sprays	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 73g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC31:Polishes and wax blends--Polishes, wax / cream (floor, furniture,	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 29 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 430.00 cm2 [ConsOC5]; for

shoes)	each use event, covers use amounts up to 142g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 1.23hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC31:Polishes and wax blends--Polishes, spray (furniture, shoes)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 8 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 430.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 35g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC34_n: Textile dyes, finishing and impregnating products--	Unless otherwise stated, covers concentrations up to 10% [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 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 115g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 1.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated

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 exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	1
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.0005
Maximum daily site tonnage (kg/day) [A4]	0.0014
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.99
Release fraction to wastewater from wide dispersive use [OOC8]	0.01
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.005
Conditions and measures related to municipal sewage treatment plant	
Risk from environmental exposure is driven by freshwater [STP7a].	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	60
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet
Section 3 Exposure Estimation
3.1. Health
Estimated consumer exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[ConsG1]
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
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
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]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

Exposure Estimation:

Human Health
See Appendix 2.b.

Environment
See PETRORISK file (Annex III).

1.6 Use in Cleaning Agents – Industrial

1.6.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Use in Cleaning Agents – Industrial GES 4.1	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 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	
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 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
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]Drum/batch transfers [CS8] PROC3	No specific measures identified[EI18]
Application of cleaning products in closed systems [CS101] PROC2	No specific measures identified[EI18]
Filling / preparation of equipment from drums or containers. [CS45] PROC8b	No specific measures identified[EI18]
Use in contained batch processes [CS37] PROC4	No specific measures identified[EI18]
Degreasing small objects in cleaning station [CS41] PROC13	No specific measures identified[EI18]
Cleaning with low-pressure washers [CS42] PROC10	No specific measures identified[EI18]
Cleaning with high pressure	No specific measures identified[EI18]

washers [CS44] PROC7	
Manual [CS34]Surfaces [CS48]Cleaning [CS47] PROC10	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 exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	7.5
Fraction of Regional tonnage used locally [A3]	1
Annual site tonnage (tonnes/year) [A5]	7.5
Maximum daily site tonnage (kg/day) [A4]	380
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.03
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.000003
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater [TCR1a]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	70
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	12000000
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet
Section 3 Exposure Estimation
3.1. Health
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]
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
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

Exposure Estimation:

Human Health

See Appendix 2.a.

Environment

See PETRORISK file (Annex III).

1.7 Use in Cleaning Agents – Professional

1.7.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Use in Cleaning Agents – Professional GES4.2	
Use Descriptor	
Sector(s) of Use	22
Process Categories	1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19 *Further information on the mapping and allocation of PROC codes is contained in Appendix 1.a.*
Environmental Release Categories	8a, 8d
Specific Environmental Release Category	ESVOC 8.4b.v1
Processes, tasks, activities covered	
Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping automated and by hand).	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
Filling / preparation of equipment from drums or containers. [CS45] PROC8b	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]Drum/batch transfers [CS8]Use in contained systems [CS38] PROC3	No specific measures identified[EI18]
Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products) [CS76] PROC4	No specific measures identified[EI18]
Filling / preparation of equipment from drums or containers. [CS45] PROC8a	No specific measures identified[EI18]
Manual [CS34]Surfaces [CS48]Cleaning [CS47]Dipping, immersion and pouring [CS4] PROC13	No specific measures identified[EI18]

Cleaning with low-pressure washers [CS42]Rolling, Brushing [CS51]no spraying [CS60] PROC10	No specific measures identified[EI18]
Cleaning with high pressure washers [CS44]Spraying [CS10]Indoor [OC8] PROC11	Avoid carrying out operation for more than 4 hours [OC12]
Cleaning with high pressure washers [CS44]Spraying [CS10]Outdoor [OC9] PROC11	Avoid carrying out operation for more than 4 hours [OC12]
Manual [CS34]Surfaces [CS48]Cleaning [CS47]Spraying [CS10] PROC10	No specific measures identified[EI18]
Ad hoc manual application via trigger sprays, dipping, etc. [CS27]Rolling, Brushing [CS51] PROC10	No specific measures identified[EI18]
Ad hoc manual application via trigger sprays, dipping, etc. [CS27]Rolling, Brushing [CS51] PROC10	No specific measures identified[EI18]
Application of cleaning products in closed systems [CS101]Outdoor [OC9] PROC4	No specific measures identified[EI18]
Cleaning of medical devices [CS74] PROC4	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 exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	7.5
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.0038
Maximum daily site tonnage (kg/day) [A4]	0.01
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.02
Release fraction to wastewater from wide dispersive use [OOC8]	0.000001
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions 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 (%) [TCR7]	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	450
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 [ERW3].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
Section 3 Exposure Estimation	
3.1. Health	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
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	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].	

Exposure Estimation:
Human Health
See Appendix 2.a.
Environment
See PETRORISK file (Annex III)..

1.8 Use in Cleaning Agents – Consumer

1.8.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Use in Cleaning Agents – Consumer GES4.3	
Use Descriptor	
Sector(s) of Use	21
Product Categories	3, 4, 8 (excipient only), 9, 24, 35, 38 *Further information on the mapping and allocation of PC codes is contained in Appendix 1.b.*
Environmental Release Categories	8a, 8d
Specific Environmental Release Category	ESVOC 8.4c.v1
Processes, tasks, activities covered	
Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of consumer exposure	
Product characteristics	
Physical form of product	liquid
Vapour pressure	56.300 kPa
Concentration of substance in product	Unless otherwise stated, cover concentrations up to 100% [ConsOC1]
Amounts used	Unless otherwise stated, covers use amounts up to13800g [ConsOC2]; covers skin contact area up to 857.5cm2 [ConsOC5]
Frequency and duration of use/exposure	Unless otherwise stated, covers use frequency up to 4 times per day [ConsOC4]; covers exposure up to 8 hours per event [ConsOC14]
Other Operational Conditions affecting exposure	Unless otherwise stated assumes use at ambient temperatures [ConsOC15]; assumes use in a 20 m3 room [ConsOC11]; assumes use with typical ventilation [ConsOC8].
Product Category	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
PC3:Air care products--Air care, instant action (aerosol sprays)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 4 times/day of use[ConsOC4]; for each use event, covers use amounts up to 0.1g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.25hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC3:Air care products--Air care, instant action (aerosol sprays)-pesticidal- excipient only	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 4 times/day of use[ConsOC4]; for each use event, covers use amounts up to 5g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.25hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC3:Air care products--Air care, continuous action (solid and liquid)	Unless otherwise stated, covers concentrations up to 10% [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 35.70 cm2 [ConsOC5]; for each use event, covers use amounts up to 0.48g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of

	20m3[ConsOC11]; for each use event, covers exposure up to 8.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC3:Air care products--Air care, continuous action (solid and liquid)-pesticidal-excipient only	Unless otherwise stated, covers concentrations up to 50% [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 35.70 cm2 [ConsOC5]; for each use event, covers use amounts up to 0.48g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 8.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products--Washing car window	Unless otherwise stated, covers concentrations up to 1% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 0.5g [ConsOC2]; Covers use in a one car garage (34m3) under typcial ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.02hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products--Pouring into radiator	Unless otherwise stated, covers concentrations up to 10% [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 428.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 2000g [ConsOC2]; Covers use in a one car garage (34m3) under typcial ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products--Lock de-icer	Unless otherwise stated, covers concentrations up to 50% [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 214.40 cm2 [ConsOC5]; for each use event, covers use amounts up to 4g [ConsOC2]; Covers use in a one car garage (34m3) under typcial ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.25hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC8_n: Biocidal products (excipient use only for solvent products)--Laundry and dish washing products	Unless otherwise stated, covers concentrations up to 5% [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 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 15g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.50hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC8_n: Biocidal products (excipient use only for solvent products)--Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners,	Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 27g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];

metal cleaners)	
	No specific RMMs identified beyond those OCs stated
PC8_n: Biocidal products (excipient use only for solvent products)--Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Unless otherwise stated, covers concentrations up to 15% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 35g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners--Waterborne latex wall paint	Unless otherwise stated, covers concentrations up to 1.5% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 2760g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners--Solvent rich, high solid, water borne paint	Unless otherwise stated, covers concentrations up to 27.5% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 744g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners--Aerosol spray can	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 2 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 215g [ConsOC2]; Covers use in a one car garage (34m3) under typcial ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners--Removers (paint-, glue-, wall paper-, sealant-remover)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 3 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 491g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay--Fillers and putty	Unless otherwise stated, covers concentrations up to 2% [ConsOC1]; covers use up to 12 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 85g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated

PC9b:Fillers, putties, plasters, modeling clay--Plasters and floor equalizers	Unless otherwise stated, covers concentrations up to 2% [ConsOC1]; covers use up to 12 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 13800g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay--Modelling clay	Unless otherwise stated, covers concentrations up to 1% [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 254.40 cm2 [ConsOC5]; for each use event, assumes swallowed amount of 1g [ConsOC13];
	No specific RMMs identified beyond those OCs stated
PC9c:Finger paints --Finger paints	Unless otherwise stated, covers concentrations up to 50% [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 254.40 cm2 [ConsOC5]; for each use event, assumes swallowed amount of 1.35g [ConsOC13];
	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Liquids	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 468.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 2200g [ConsOC2]; Covers use in a one car garage (34m3) under typcial ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Pastes	Unless otherwise stated, covers concentrations up to 20% [ConsOC1]; covers use up to 10 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 468.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 34g [ConsOC2];
	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Sprays	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 73g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC35:Washing and cleaning products (including solvent based products)--Laundry and dish washing products	Unless otherwise stated, covers concentrations up to 5% [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 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 15g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.50hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC35:Washing and cleaning products (including solvent	Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of

based products)--Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 27g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC35:Washing and cleaning products (including solvent based products)--Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Unless otherwise stated, covers concentrations up to 15% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 35g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC38_n: Welding and soldering products, flux products--NOTE, n_assessment not in TRA	Unless otherwise stated, covers concentrations up to 20% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 12g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 1.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated

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 exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	42
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.021
Maximum daily site tonnage (kg/day) [A4]	0.057
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.95
Release fraction to wastewater from wide dispersive use [OOC8]	0.025
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.025
Conditions and measures related to municipal sewage treatment plant	
Risk from environmental exposure is driven by freshwater [STP7a].	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	1800
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet
Section 3 Exposure Estimation
3.1. Health
Estimated consumer exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[ConsG1]
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
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
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]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

Exposure Estimation:
Human Health
See Appendix 2.b.
Environment
See PETRORISK file (Annex III)..

1.9 Use as a Blowing Agent – Industrial
1.9.1Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Use as a Blowing Agent – Industrial GES9.1	
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	ESVOC 4.9.v1
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.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
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 shavings, cuttings, etc [CS123] PROC12	No specific measures identified[EI18]
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	Provide enhanced mechanical ventilation by mechanical means [E48]
Intermediate polymer storage [CS66]Operation is carried out at elevated temperature (> then 20°C above ambient	Provide enhanced mechanical ventilation by mechanical means [E48]

temperature) [OC7] PROC3	
Centrifuging including discharging [CS127]Operation is carried out at elevated temperature (> then 20°C above ambient temperature) [OC7] PROC3	Provide enhanced mechanical ventilation by mechanical means [E48]
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 temperature) [OC7] PROC12	Provide enhanced mechanical ventilation by mechanical means [E48]
Drying and storage [CS12] PROC12	No specific measures identified[EI18]
Article formation in mould [CS130]Operation is carried out at elevated temperature (> then 20°C above ambient temperature) [OC7] PROC12	Provide enhanced mechanical ventilation by mechanical means [E48]
Cutting by heated wire [CS131]Manual [CS34] PROC12	No specific measures identified[EI18]
Mixing operations (closed systems) [CS29] PROC3	No specific measures identified[EI18]
Drum and small package filling [CS6]Filling / preparation of equipment from drums or containers. [CS45] PROC9	No specific measures identified[EI18]
Foaming [CS132] PROC12	No specific measures identified[EI18]
Compression [CS133] PROC12	No specific measures identified[EI18]
Cutting by heated wire [CS131] PROC12	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 exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	1500
Fraction of Regional tonnage used locally [A3]	1
Annual site tonnage (tonnes/year) [A5]	1500
Maximum daily site tonnage (kg/day) [A4]	15000
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	100
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	

Release fraction to air from process (initial release prior to RMM) [OOC4]	1.0
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.00003
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by agricultural soil [TCR1f]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	2500000
Assumed domestic sewage treatment plant flow (m^3/d) [STP4]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
Section 3 Exposure Estimation	
3.1. Health	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
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	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].	

Exposure Estimation:
Human Health
See Appendix 2.a.
Environment See PETRORISK file (Annex III)..

1.10 Use in Agrochemicals – Professional

1.10.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Use in Agrochemicals – Professional GES11.2	
Use Descriptor	
Sector(s) of Use	22
Process Categories	1, 2, 4, 8a, 8b, 11, 13 *Further information on the mapping and allocation of PROC codes is contained in Appendix 1.a.*
Environmental Release Categories	8a, 8d
Specific Environmental Release Category	ESVOC 8.11a.v1
Processes, tasks, activities covered	
Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
Transfer from/pouring from containers [CS22] PROC8b	No specific measures identified[EI18]
Mixing and blending [CS23] PROC4	No specific measures identified[EI18]
Spraying/fogging by manual application [CS24] PROC11	Avoid carrying out operation for more than 4 hours [OC12]
Spraying/fogging by machine application [CS25] PROC11	Avoid carrying out operation for more than 4 hours [OC12]
Ad hoc manual application via trigger sprays, dipping, etc. [CS27] PROC13	No specific measures identified[EI18]
Clean-down and maintenance of equipment [CS26] PROC8a	No specific measures identified[EI18]
Disposal of wastes [CS28] 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 exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	

Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	10
Fraction of Regional tonnage used locally [A3]	0.002
Annual site tonnage (tonnes/year) [A5]	0.02
Maximum daily site tonnage (kg/day) [A4]	0.055
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.9
Release fraction to wastewater from wide dispersive use [OOC8]	0.01
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.09
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions 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 (%) [TCR7]	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	2100
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
Section 3 Exposure Estimation	
3.1. Health	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
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
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

Exposure Estimation:
Human Health
See Appendix 2.a.
Environment
See PETRORISK file (Annex III)..

1.11 Use as a Fuel – Industrial

1.11.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Use as a Fuel – Industrial GES12.1	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 8a, 8b, 16 *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 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure < 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
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[EI18]
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[EI18]
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 exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	4
Fraction of Regional tonnage used locally [A3]	1
Annual site tonnage (tonnes/year) [A5]	4
Maximum daily site tonnage (kg/day) [A4]	200
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.0025
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.00001
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions 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 (%) [TCR7]	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	5500000
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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].
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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet
Section 3 Exposure Estimation
3.1. Health
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]
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
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

Exposure Estimation:
Human Health
See Appendix 2.a.
Environment
See PETRORISK file (Annex III)..

1.12 Use as a Fuel – Professional

1.12.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Use as a Fuel – Professional GES12.2	
Use Descriptor	
Sector(s) of Use	22
Process Categories	1, 2, 3, 8a, 8b, 16 *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	ESVOC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
Bulk transfers [CS14] PROC8b	No specific measures identified[EI18]
Drum/batch transfers [CS8] PROC8b	No specific measures identified[EI18]
General exposures [CS1] PROC8b	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] PROC3	No specific measures identified[EI18]
General exposures (closed systems) [CS15](closed systems) [CS107] PROC16	No specific measures identified[EI18]
Equipment cleaning and maintenance [CS39] PROC8a	No specific measures identified[EI18]
Vessel and container cleaning [CS103] PROC8a	No specific measures identified[EI18]
Material storage [CS67] PROC1	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 exposure	

Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	10
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.005
Maximum daily site tonnage (kg/day) [A4]	0.014
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.01
Release fraction to wastewater from wide dispersive use [OOC8]	0.00001
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions 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 (%) [TCR7]	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	600
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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].	
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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
Section 3 Exposure Estimation	
3.1. Health	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
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
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

Exposure Estimation:

Human Health

See Appendix 2.a.

Environment

See PETRORISK file (Annex III)..

1.13 Use as a Fuel – Consumer

1.13.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Use as a Fuel – Consumer GES12.3	
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 liquid fuels.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of consumer exposure	
Product characteristics	
Physical form of product	liquid
Vapour pressure	56.3 kPa
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 1 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 m3 room [ConsOC11]; assumes use with typical ventilation [ConsOC8].
Product Category	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
PC13:Fuels--Liquid - subcategories added: Automotive Refuelling	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];
	No specific RMMs developed beyong those OCs stated
PC13:Fuels--Liquid - subcategories added: Scooter Refuelling	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];
	No specific RMMs developed beyong those OCs stated
PC13:Fuels--Liquid - subcategories added: Garden Equipment - Use	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 26 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 750g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	No specific RMMs developed beyong those OCs stated
PC13:Fuels--Liquid (subcategories added): Garden	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 26 days/year[ConsOC3]; covers use up to 1 time/on day of

Equipment - Refueling	use[ConsOC4]; covers skin contact area up to 420.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 750g [ConsOC2]; Covers use in a one car garage (34m3) under typcial ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.03hr/event[ConsOC14];
	No specific RMMs developed beyong those OCs stated
PC13:Fuels--Liquid - subcategories added: Lamp oil	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];
	No specific RMMs developed beyong those OCs stated
PC13:Fuels--Liquid (subcategories added): Home space heater fuel	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];
	No specific RMMs developed beyong those OCs stated
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 exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	720
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.36
Maximum daily site tonnage (kg/day) [A4]	0.99
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.01
Release fraction to wastewater from wide dispersive use [OOC8]	0.00001
Release fraction to soil from wide dispersive use (regional only [OOC9]	0.00001
Conditions and measures related to municipal sewage treatment plant	
Risk from environmental exposure is driven by freshwater [STP7a].	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	43000
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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].	
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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	

Section 3 Exposure Estimation
3.1. Health
Estimated consumer exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[ConsG1]
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
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
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]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

Exposure Estimation:
Human Health
See Appendix 2.b.
Environment
See PETRORISK file (Annex III)..

1.14 Use as Functional Fluids – Industrial

1.14.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Use as Functional Fluids – Industrial GES13.1	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 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 oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
Bulk transfers [CS14](closed systems) [CS107] PROC1	No specific measures identified[EI18]
Bulk transfers [CS14](closed systems) [CS107] PROC2	No specific measures identified[EI18]
Drum/batch transfers [CS8] PROC8b	No specific measures identified[EI18]
Filling of articles/equipment [CS84](closed systems) [CS107] PROC9	No specific measures identified[EI18]
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	Provide enhanced mechanical ventilation by mechanical means [E48]
Remanufacture of reject articles [CS19] PROC9	No specific measures identified[EI18]
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 allocation of the identified OCs and RMMs is contained in	

Appendices 1 to 3	
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	9200
Fraction of Regional tonnage used locally [A3]	0.0011
Annual site tonnage (tonnes/year) [A5]	10
Maximum daily site tonnage (kg/day) [A4]	500
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.01
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.0003
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0.001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	4300000
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
Section 3 Exposure Estimation	
3.1. Health	

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]
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
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

Exposure Estimation:
Human Health
See Appendix 2.a.
Environment
See PETRORISK file (Annex III)..

1.15 Use as Functional Fluids – Professional

1.15.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Use as Functional Fluids – Professional GES13.2	
Use Descriptor	
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	ESVOC 9.13b.v1
Processes, tasks, activities covered	
Use as functional fluids e.g. cable oils, transfer oils, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
Drum/batch transfers [CS8] PROC8a	No specific measures identified[EI18]
Transfer from/pouring from containers [CS22] PROC9	No specific measures identified[EI18]
Filling / preparation of equipment from drums or containers. [CS45] PROC9	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] PROC3	No specific measures identified[EI18]
General exposures (open systems) [CS16] PROC20	No specific measures identified[EI18]
Remanufacture of reject articles [CS19] PROC9	Provide enhanced mechanical ventilation by mechanical means [E48]
Remanufacture of reject articles [CS19] PROC9	No specific measures identified[EI18]
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 allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	50
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.025
Maximum daily site tonnage (kg/day) [A4]	0.068
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.05
Release fraction to wastewater from wide dispersive use [OOC8]	0.025
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.025
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions 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 (%) [TCR7]	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	2000
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
Section 3 Exposure Estimation	
3.1. Health	

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]
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
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

Exposure Estimation:
Human Health
See Appendix 2.a.
Environment
See PETRORISK file (Annex III)..

1.16 Other Consumer Uses – Consumer

1.16.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Other Consumer Uses – Consumer GES16.3	
Use Descriptor	
Sector(s) of Use	21
Product Categories	28, 39 *Further information on the mapping and allocation of PC codes is contained in Appendix 1.b.*
Environmental Release Categories	8a, 8d
Specific Environmental Release Category	ESVOC 8.16.v1
Processes, tasks, activities covered	
Consumer uses not covered in consumer examples listed above e.g. use as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of consumer exposure	
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	160
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.081
Maximum daily site tonnage (kg/day) [A4]	0.022
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.95
Release fraction to wastewater from wide dispersive use [OOC8]	0.025
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.025
Conditions and measures related to municipal sewage treatment plant	
Risk from environmental exposure is driven by freshwater sediment [STP7b].	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	5200
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet
Section 3 Exposure Estimation
3.1. Health
Estimated consumer exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[ConsG1]
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
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
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]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

Exposure Estimation:

Human Health
See Appendix 2.a.

Environment
See PETRORISK file (Annex III)..

1.17 Use in Laboratories – Industrial

1.17.1 Exposure Scenario

Section 1 Exposure Scenario Title	
Title	
Use in Laboratories – Industrial GES17.1	
Use Descriptor	
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 Category	*Not Applicable*
Processes, tasks, activities covered	
Use of the substance within laboratory settings, including material transfers and equipment cleaning.	
Assessment Method	
See Section 3 [AM1].	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions *(only required controls to demonstrate safe use listed)***
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]
Cleaning [CS47] PROC10	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 exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	5
Fraction of Regional tonnage used locally [A3]	0.4
Annual site tonnage (tonnes/year) [A5]	2
Maximum daily site tonnage (kg/day) [A4]	100
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.025

Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.02
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	6500
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
Section 3 Exposure Estimation	
3.1. Health	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
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	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
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].	

Exposure Estimation:

Human Health

See Appendix 2.a.

Environment

See PETRORISK file (Annex III)..

1.18 Use in Laboratories – Professional

1.18.1 Exposure Scenario

Section 1 Exposure Scenario Title		
Title		
Use in Laboratories – Professional GES17.2		
Use Descriptor		
Sector(s) of Use	22	
Process Categories	10, 15 *Further information on the mapping and allocation of PROC codes is contained in Appendix 1.a.*	
Environmental Release Categories	8a	
Specific Environmental Release Category	ESVOC 8.17.v1	
Processes, tasks, activities covered		
Use of small quantities within laboratory settings, including material transfers and equipment cleaning.		
Assessment Method		
See Section 3 [AM1].		
Section 2 Operational conditions and risk management measures		
Section 2.1 Control of worker exposure		
Product characteristics		
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]	
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless 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]	
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions** ***(only required controls to demonstrate safe use listed)***	
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]	
Cleaning [CS47] PROC10	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 exposure		
Product characteristics		
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].		
Amounts used		
Fraction of EU tonnage used in region [A1]		0.1
Regional use tonnage (tonnes/year) [A2]		5
Fraction of Regional tonnage used locally [A3]		0.0005
Annual site tonnage (tonnes/year) [A5]		0.0025
Maximum daily site tonnage (kg/day) [A4]		0.0069
Frequency and duration of use		
Continuous release [FD2].		
Emission days (days/year) [FD4]		365
Environmental factors not influenced by risk management		
Local freshwater dilution factor [EF1]		10
Local marine water dilution factor [EF2]		100
Other given operational conditions affecting environmental exposure		
Release fraction to air from wide dispersive use (regional only) [OOC7]		0.5

Release fraction to wastewater from wide dispersive use [OOC8]	0.5
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by frehwater sediment [TCR1b]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) [TCR10]	0
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 wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d) [STP6]	260
Assumed domestic sewage treatment plant flow (m^3/d) [STP5]	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 indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
Section 3 Exposure Estimation	
3.1. Health	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
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	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
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 SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].	

Exposure Estimation:
Human Health
See Appendix 2.a.
Environment
See PETRORISK file (Annex III).

1.19 Regional Environment Exposure Estimation

See *PETRORISK file* – "RegionalCSR" worksheet

1.20 ASPIRATION HAZARD (R65) QUALITATIVE CSA

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).

'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.

1.21 SKIN DEFATTING HAZARD (R66) QUALITATIVE CSA

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 Chemical Safety Assessment (CSA) approach aims to reduce/avoid contact when there is no basis for setting a DNEL or DMEL for a certain human health adverse effect, i.e. when the available data for this adverse effect do not provide quantitative dose-response information, but there exist toxicity data appropriate to allow a qualitative risk characterisation. The end points for which the available data may trigger a qualitative risk characterisation includes defatting of the skin (R66). This hazard is considered to be very low hazard.

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 – "LocalCSR" worksheet

2.2 Distribution of Substance – Industrial

2.2.1 Human Health
See Appendix A.

2.2.2 Environment
See PETRORISK file – "LocalCSR" worksheet

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 – "LocalCSR" worksheet

2.4 Uses in Coatings – Industrial

2.4.1 Human Health
See Appendix A.

2.4.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.5 Uses in Coatings – Consumer

2.5.1 Human Health
See Appendix A.

2.5.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.6 Use in Cleaning Agents – Industrial

2.6.1 Human Health
See Appendix A.

2.6.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.7 Use in Cleaning Agents – Professional

2.7.1 Human Health
See Appendix A.

2.7.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.8 Use in Cleaning Agents – Consumer

2.8.1 Human Health
See Appendix A.

2.8.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.9 Use as Blowing Agents – Industrial

2.9.1 Human Health
See Appendix A.

2.9.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.10 Use in Agrochemicals – Professional

2.10.1 Human Health
See Appendix A.

2.10.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.11 Use as a Fuel – Industrial

2.11.1 Human Health
See Appendix A.

2.11.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.12 Use as a Fuel – Professional

2.12.1 Human Health
See Appendix A.

2.12.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.13 Use as a Fuel – Consumer

2.13.1 Human Health
See Appendix A.

2.13.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.14 Use as Functional Fluids – Industrial

2.14.1 Human Health
See Appendix A.

2.14.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.15 Use as Functional Fluids – Professional

2.15.1 Human Health
See Appendix A.

2.15.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.16 Other Consumer Uses – Consumer

2.16.1 Human Health
See Appendix A.

2.16.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.17 Use in Laboratories – Industrial

2.17.1 Human Health
See Appendix A.

2.17.2 Environment
See PETRORISK file – "LocalCSR" worksheet

2.18 Use in Laboratories – Professional

2.18.1 Human Health
See Appendix A.

2.18.2 Environment
See PETRORISK file – "LocalCSR" worksheet

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

2.19.1 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.

2.19.2 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.

2.20 Regional Environment
See PETRORISK file – "RegionalCSR" worksheet

2.21 ASPIRATION HAZARD (R65) QUALITATIVE CSA

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 no concern.
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 to.... in accordance with local/regional/ national/international regulations (to be specified)	**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

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.

2.22 SKIN DEFATTING HAZARD (R66) QUALITATIVE CSA

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 clothing/eye 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 1a
Use Mapping/Operational Conditions – worker

1.1 Manufacture of Substance – Industrial

Table 1: Mapping Uses in the Supply Chain

	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					Text	LEV	Process Category equivalent
Manufacture of substance	**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 point	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	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; Indoor/Outdoor	Enclosed lines; retain wash down in sealed storage pending disposal or use as recycled material for subsequent formulation. PPE.	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)

1.2 Distribution of Substance – Industrial

Table 1: Mapping Uses in the Supply Chain

	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					Text	LEV	Process Category equivalent
Distribution of substance	**Industrial - SU3**	General process exposures - closed process (e.g. In-line additive dosing equipment, in-line filter cleaning)	**CS15**	Continuous; Outdoor; daily; 15 - 1 hour; product temp.	Closed process. No exposure.	Closed process. No exposure.	PROC1 Closed process (no sampling)
	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 required in practice	**Industrial - SU3**	Bulk closed loading and unloading NEW CS (e.g. road/rail car bottom loading/unloading; marine vessel/barge loading/unloading;)	**CS14, CS107 Bulk transfers (closed systems)**	Outdoor; Daily; 15 - 1 hour; product temp.; exposure potential during breaking of hose connection	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 vapour emissions from tank opening	Enclosed transfers, submerged loading via tank opening, collection of drips from loading arm. May involve LEV.	With LEV	PROC8b Dedicated discharging to/from vessels
	Industrial - SU3	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/mixture 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 recycled material for subsequent formulation. PPE.	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)

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

Table 1: Mapping Uses in the Supply Chain

	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					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 equipment, in-line filter cleaning)	CS15	Continuous; daily; 15 - 1 hour; product temp.	Closed processes	Closed process. No exposure.	PROC1 Closed process (no sampling)
	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 filter cleaning)	CS15	Batch process; daily; 15 - 1 hour; product temp.	Closed equipment, enclosed or vented sampling points	No LEV	PROC3 Closed batch process (with sampling)
	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 transfer points and mixing vessels	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 manufacture, grease manufacture)	CS136	Batch process; daily; 15 - 1 hour; product temp.	Closed equipment, enclosed or vented sampling points, vented mixing/process vessels	With LEV	PROC3 Closed batch process (with sampling)
	Industrial - SU3/ 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
	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	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
	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, extrusion, pelletisation
	Industrial - SU3/ 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/mixture 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 recycled material for subsequent formulation. PPE.	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	outdoor activity	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)

1.4 Uses in Coatings – Industrial

Table 1: Mapping Uses in the Supply Chain

	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					Text	LEV	Process Category equivalent
Use 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 controlled
	Industrial - SU3	Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing [CS94].	**[CS94]**	**Elevated Temperatures**	enclosed in situ in workplace	With LEV	PROC2 - Use in closed, continuous process with occasional controlled exposure
	Industrial - SU3	Mixing operations (closed systems) [CS29].	**[CS29] [CS15]**			With LEV	PROC3 - Use in closed batch process (synthesis or formulation)
	Industrial - SU3	Film formation - air drying [CS95].	**[CS95]**	**Duration**		With LEV	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
	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 significant contact)
	Industrial - SU3	Spraying (automatic/robotic) [CS97].	**[CS97]**	Daily; >4 hours, ambient	Enclosed. Vented spray booth; specific workforce education, PPE	With LEV	PROC7 -Industrial spraying
	Industrial - SU3	Manual [CS34].	**[CS34] [CS10]**		Open , Air supplied masks, respirator.	NO LEV	PROC7 -Industrial spraying
Duration Option	**Industrial - SU3**	Material transfers [CS3].	**[CS3]**	Daily; 15 min - 1 hour; ambient temp; collection of line waste in container. outdoor/ indoor.	Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	PROC8a -Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
	Industrial - SU3	Material transfers [CS3].	**[CS3]**	Daily; 15 min - 1 hour; ambient temp; collection of line waste in container. outdoor/ indoor.	Enclosed transfers, vented transfer points; clear lines prior to decoupling	With LEV	PROC8b -Transfer of chemicals from/to vessels/ large containers at dedicated facilities
	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. Large scale (open equipment)	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 dipping and pouring
	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
	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)
	Industrial - SU3	Production or preparation or articles by tabletting, compression, extrusion or pelletisation [CS100].	**[CS100]**	Daily; 15 min - 1 hour; ambient temp;	wear goggles and gloves	With LEV	PROC14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation

1.5 Use in Cleaning Agents – Industrial

Table 1: Mapping Uses in the Supply Chain							
	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					Text	LEV	Process Category equivalent
Uses in Cleaning	Industrial - SU3	Bulk transfers [CS14].	[CS14]	Daily; 15 min - 1 hour; ambient temp; collection of line waste in container	Enclosed transfers, vented transfer points; clear lines prior to decoupling	Yes	PROC8a -Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
	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 controlled exposure
	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)
	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 controlled exposure
	Industrial - SU3	Filling / preparation of equipment from drums or containers. [CS45].	[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 facilities
	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 exposure arises
	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
	Industrial - SU3	Cleaning with low-pressure washers [CS42].	[CS42]	Daily; 15min - 1hour; ambient temp	specific workforce education, PPE	No	PROC10 - Roller application or brushing
	Industrial - SU3	Cleaning with high pressure washers [CS44].	[CS44]	Daily; 15min - 1hour; ambient temp	specific workforce education, PPE	No	PROC7 -Industrial spraying
	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

1.6 Use in Cleaning Agents – Professional

Table 1: Mapping Uses in the Supply Chain

	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					Text	LEV	Process Category equivalent
The professional use as a component of cleaning products.	Professional - SU22	Filling / preparation of equipment from drums or containers. [CS45].	[CS45]	daily; 15min - 1 hour; ambient temp (<10%)	Manual transfer from small pack to application equipment.	No	PROC8b -Transfer of chemicals from/to vessels/ large containers at dedicated facilities
	Professional - SU22	Automated process with (semi) closed systems. [CS93].	[CS93]	daily; 8hour	Enclosed process; closed	No	PROC2 - Use in closed, continuous process with occasional controlled exposure
	Professional - SU22	Automated process with (semi) closed systems. [CS93].	[CS93]	daily; 15min - 1 hour	Enclosed process; closed	No	PROC3 - Use in closed batch process (synthesis or formulation)
	Professional - SU22	Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products) [CS76].	[CS76]	daily; 8hour	Semi enclosed process; closed	No	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
	Professional - SU22	Filling / preparation of equipment from drums or containers. [CS45].	[CS45]	daily; 15min - 1 hour; ambient temp Outdoors	Manual transfer from small pack to application equipment.	No	PROC8a -Transfer of chemicals from/to vessels/ large containers at non dedicated facilities.
	Professional - SU22	Manual [CS34].	[CS34]	Daily; >4 hours, ambient	No Local exhaust ventilation at open surface; remove spills as they occur, PPE	No	PROC13 - Treatment of articles by dipping and pouring
	Professional - SU22	Cleaning with low-pressure washers [CS42].	[CS42]	Daily; >4 hours, ambient temp. 5% max	specific workforce education, PPE	No	PROC10 - Roller application or brushing
	Professional - SU22	Cleaning with high pressure washers [CS44].	[CS44]	Daily; 8 hours; ambient temp. Indoor. 0.5% max	specific workforce education, PPE	No	PROC11- Non industrial spraying
	Professional - SU22	Cleaning with high pressure washers [CS44].	[CS44]	Daily; 8 hours; ambient temp. Outdoor 0.5% max	specific workforce education, PPE	No	PROC11- Non industrial spraying
	Professional - SU22	Manual [CS34].	[CS34]	Daily; >4 hours; ambient temp. 10% max.	waste is flushed out with waste water, wipe cloths in container.	No	PROC10 - Roller application or brushing
	Professional - SU22	Ad hoc manual application via trigger sprays, dipping, etc. [CS27].	[CS27]	Daily; >4 hours; ambient temp. in a workshop"(with LEV). Daily; < 1 hours; ambient temp. occasional use	waste is flushed out with waste water, wipe cloths in container.	Yes	PROC10 - Roller application or brushing
	Professional - SU22	Ad hoc manual application via trigger sprays, dipping, etc. [CS27].	[CS27]	Daily; >4 hours; ambient temp. in a workshop"(with LEV). Daily; < 1 hours; ambient temp. occasional use	waste is flushed out with waste water, wipe cloths in container.	No	PROC10 - Roller application or brushing
	Professional - SU22	Application of cleaning products in closed systems [CS101].	[CS101]	daily; 8hour	Enclosed process; closed/semi-closed		PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
	Professional - SU22	Cleaning of medical devices [CS74].	[CS74]	daily; 8hour	Enclosed process; closed/semi-closed	Yes	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises

1.7 Use as a Blowing Agent – Industrial

Table 1: Mapping Uses in the Supply Chain

	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					Text	LEV	Process Category equivalent
Blowing agents	Industrial - SU 3	Delivery of solvent to plant storage	CS14	Closed system, ambient temp. Filling point outdoors. Exposure potential limited to coupling/uncoupling activities (<15 min/d)	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 direct contact with product	General ventilation	NO LEV	PROC12
	Industrial - SU 3	Mixing with polystyrene beads in reactor	CS29	Closed system, Operating Temp. 120-130 dC (**elevated temperature**); 4.5% agent in mix	Closed system; remotely controlled / automatic operation; forced area ventilation; air monitoring to detect leakages	With LEV	PROC3
	Industrial - SU 3	Transfer to and holding in waiting tank	CS66	Closed system, **elevated temperature**; 4.5% agent in mix	Closed system; remotely controlled / automatic operation; forced area ventilation; air monitoring to detect leakages	NO LEV	PROC3
	Industrial - SU 3	Centrifuging of slurry of beads and process water	CS127	Closed system, **elevated temperature**; 4.5% agent in mix	Closed system; remotely controlled / automatic operation; forced area ventilation; air monitoring to detect leakages	NO LEV	PROC3
	Industrial - SU 3	Drying of polystyrene powder/granules	CS12	Indoor, ambient temp. Dedicated equipment.	Vented silo	NO LEV	PROC12
	Industrial - SU 3	Loading/packaging 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 granulate	CS129	4% blowing agent in granulate; **Elevated temperature**	Ventilation, waste air treatment	NO LEV	PROC12
	Industrial - SU 3	Storage and ageing of partially expanded polystyrene granulate	CS129	Open silo's; 3% blowing agent in granulate	Vented silo	NO LEV	PROC12
	Industrial - SU 3	Moulding and block forming with expanded polystyrene granulate	CS130	Use of steam in partially closed moulds; **elevated temperature**; 2% blowing agent in granulate	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 left	LEV/enclosure	With LEV	PROC12

1.8 Use in Agrochemicals – Professional

Table 1: Mapping Uses in the Supply Chain							
	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					Text	LEV	Process Category equivalent
Use in Agrochemicals	**Professional - SU22**	transfer from/pouring from containers	**CS22**	Daily; 15 mins - 1 hour; ambient temp	gloves	No LEV	PROC8b Discharging to/from vessels
10 and 50 checked and GESs revised	**Professional - SU22**	mixing in containers	**CS23**	Daily; 15 - 1 hour; ambient temp.	outdoors. Gloves	No LEV	PROC4 Closed batch process (with sampling)
	Professional - SU22	spraying and fogging by manual application.	**CS24**	Daily; 1-4 hours; ambient temp;	outdoors. Full protective body suit and RPE.	No LEV	PROC11 - Non industrial spraying
	Professional - SU22	spraying and fogging by machine application	**CS25**	Daily; 1-4 hours; ambient temp;	ventilated cab	With LEV	PROC11 - Non industrial spraying
	Professional - SU22	small ad hoc application via dipping, trigger sprays, etc	**CS27**	<1 hours daily; ambient temp.	none	No LEV	PROC13 - Treatment of articles by dipping and pouring
	Professional - SU22	cleandown and maintenance of equipment	**CS26**	<1 hours daily; ambient temp.	Retain drainings in sealed storage pending disposal. PPE.	No LEV	PROC8a Discharging to/from vessels
	Professional - SU22	disposal of wastes	**CS28**	<1 hours daily; ambient temp.	outdoors. Gloves	No LEV	PROC8a Discharging to/from vessels
	Professional - SU22	Storage	**CS67**	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC1
	Professional - SU23	Storage	**CS67**	Daily; 8 hrs; ambient temp;	samples collected at dedicated sample point	No LEV	PROC2 Closed continuous process (sometimes with sampling)

1.9 Use as a Fuel – Industrial

Table 1: Mapping Uses in the Supply Chain

	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					Text	LEV	Process Category equivalent
Use as a fuel	**Industrial -SU3**	Bulk transfers (barge, rail and road)	**CS14**	Daily; 1 - 4 hours; ambient temp.	Enclosed transfers, clear lines prior to decoupling	No LEV	PROC8b Dedicated Discharging to/from vessels
	Industrial -SU3	Transfers from drums and containers	**CS8**	Daily; 1 - 4 hours; ambient temp.	Pumped transfer from drum to equipment	No LEV	PROC8b Dedicated Discharging to/from vessels
	Industrial -SU3	General use exposures as a fuel	**CS15**	Daily; >4 hours	Closed equipment	No LEV	PROC1 Use as a fuel
	Industrial -SU3	General use exposures as a fuel	**CS15**	Daily; >4 hours	Closed equipment	No LEV	PROC2 Use as a fuel
	Industrial -SU3	Use a fuel	**CS15 CS107**	Daily; >4 hours, to 100%	Closed equipment	No LEV	PROC16 - use as a fuel
	Industrial -SU3	Use a fuel additive diluent	**CS15 CS107**	Daily; >4 hours, to 100%	Closed equipment	No LEV	PROC3 Closed batch process (with sampling)
	Industrial -SU3	Vehicle/boiler maintenance	**CS39 (changed from CS5)**	Daily; >4 hours, to 100%	PPE. Operator training.	No LEV	PROC8a Non-dedicated Discharging to/from vessels
	Industrial -SU3	Cleaning fuel storage tanks	**CS103**	Infrequent; >4 hours	vessel entry procedures, retain wash down in sealed storage pending disposal,. PPE.	With supplied air ventilation, PTW	PROC8a Discharging to/from vessels
	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)

1.10 Use as a Fuel – Professional

Table 1: Mapping Uses in the Supply Chain

	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					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
	~~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
	~~Professional - SU22~~	General use exposures as a fuel	**CS15**	Daily; >4 hours	Closed equipment	No LEV	PROC1 Use as a fuel
	~~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	~~**GES16,**~~ **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, pump calibration	**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. PPE.	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)

1.11 Use as Functional Fluids – Industrial

Table 1: Mapping Uses in the Supply Chain

	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					Text	LEV	Process Category equivalent
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	PROC1 Closed 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
	Industrial -SU10	operation of open equipment containing functional fluids at **elevated temperatures**	**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)

1.12 Use as Functional Fluids – Professional

Table 1: Mapping Uses in the Supply Chain

	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					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 points	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
	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 temperatures**	**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)

1.13 Use in Laboratory Applications – Industrial

	Table 1: Mapping Uses in the Supply Chain						
	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					Text	LEV	Process Category equivalent
Use in laboratories	**Industrial - SU3, 8, etc**	CS36 Laboratory activities	**CS36**	Continuous; daily; > 4 hour; ambient temp.	Fume cupboard or ventilated glove-box; Bench-mounted local extract ventilation;Controlled general ventilation (10 ACH);selected disposable gloves	Yes	PROC15
	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 ventilation;Controlled general ventilation (10 ACH);selected disposable gloves	Yes	PROC10

1.14 Use in Laboratory Applications – Professional

Table 1: Mapping Uses in the Supply Chain							
	User Group	Contributing Scenarios	CS Ref	Typical Mapped Operating Conditions	Typical Mapped RMMs		Use Descriptor
					Text	LEV	Process Category equivalent
Use in laboratories	**Professional - SU22**	CS36 Laboratory activities	**CS36**	Continuous; daily; > 4 hour; ambient temp.	Fume cupboard or ventilated glove-box; Bench-mounted local extract ventilation;Controlled general ventilation (10 ACH);selected disposable gloves	With LEV	PROC15
	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 ventilation;Controlled general ventilation (10 ACH);selected disposable gloves	Without LEV	PROC10

Appendix 1B
Use Mapping/Operational Conditions – Consumer

1.1 Uses in Coatings – Consumer

TRA

Table 1: Mapping Consumer Uses in the Supply Chain				Table 2a: Characterising the Risk - based on defaults (ECETOC TRA Consumers)										
				all	all			all	d	o	i	i	i	
Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels	Product ingredient (g/g)	adult / child			Product is spray? (S)	frequency (events per day)	Skin surface contact area (cm2)	Amount Swallowed (g)	Amount Used per event (g)	room volume (m3)	exposure time (hr)
Short Title	Area of Application / UD				d	o	i							
Coating	Consumer-SU21	PC1:Adhesives, sealants	Glues, hobby use	0.3	A		A		1	35.73		9	20	4
Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.	Consumer-SU21	PC1:Adhesives, sealants	Glues DIY-use (carpet glue, tile glue, wood parquet glue)	0.3	A		A		1	428.75		15000	20	6
PC1, PC4, PC8, PC9, PC15, PC18, PC23, PC24, PC31,PC34, (PC5, PC10)	Consumer-SU21	PC1:Adhesives, sealants	Glue from spray	0.3	A		A	S	1	35.73		255	20	4
	Consumer-SU21	PC1:Adhesives, sealants	Sealants	0.3	A		A		1	35.73		390	20	4
	Consumer-SU21	PC4_n:Anti-freeze and de-icing products	Washing car window	0.01			A		1			0.5	34	0.017
	Consumer-SU21	PC4_n:Anti-freeze and de-icing products	Pouring into radiator	0.1	A		A		1	857.5		2000	34	0.167
		PC4_n:Anti-freeze and de-icing products	Lock de-icer	0.5	A		A	S	1	214.4		4	34	0.25
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Laundry and dish washing products	0.6	A		A		1	857.5		50	20	1
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	0.5	A		A		1	857.5		250	20	0.33
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	0.2	A		A	S	1	857.5		35	20	4
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Waterborne latex wall paint	0.5	A		A		1	428.75		3750	20	2.2
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Solvent rich, high solid, water borne paint	0.5	A		A		1	428.75		1300	20	2.2
			Tier 2: ConsExpo estimates											
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Aerosol spray can	0.5			A	S	1			300	20	0.33
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Removers (paint-, glue-, wall paper-, sealant-remover)	0.9	A		A		1	857.5		2000	20	4
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Fillers and putty	1	A		A		1	35.73		1000	20	4
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Plasters and floor equalizers	1	A		A		1	857.5		25000	20	2
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Modelling clay	0.1	C	C			1	254.4	1		20	
	Consumer-SU21	PC9c:Finger paints	Finger paints	0.5	C	C			1	254.4	1.35		20	
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Waterborne latex wall paint	0.5	A		A		1	428.75		3750	20	2.2
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Solvent rich, high solid, water borne paint	0.5	A		A		1	428.75		1300	20	2.2
			Tier 2: ConsExpo estimates											
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Aerosol spray can	0.5			A	S	1			300	20	0.33
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Removers (paint-, glue-, wall paper-, sealant-remover)	0.9	A		A		1	857.5		2000	20	4
	Consumer-SU21	PC18_n: Ink and toners	Inks and toners.	0.1	A		A		1	71.4		40	20	2.2
	Consumer-SU21	PC23_n: Leather tanning, dye, finishing, impregnation and care products	Polishes, wax / cream (floor, furniture, shoes)	0.5	A		A		1	857.5		56	20	1
	Consumer-SU21	PC23_n: Leather tanning, dye, finishing, impregnation and care products	Polishes, spray (furniture, shoes)	0.5	A		A	S	1	857.5		56	20	1
	Consumer-SU21	PC24: Lubricants, greases, and release products	Liquids	0.5	A		A		1	857.5		5000	20	4
			Tier 2: skin permeability for dermall- if go this route and RCR still >1, select the set of DNEL band conditions from Tier1 that will provide RCR<1											
	Consumer-SU21	PC24: Lubricants, greases, and release products	Pastes	0.2	A				1	857.5			20	
	Consumer-SU21	PC24: Lubricants, greases, and release products	Sprays	0.5	A		A	S	1	428.75		300	20	4
	Consumer-SU21	PC31:Polishes and wax blends	Polishes, wax / cream (floor, furniture, shoes)	0.5	A		A		1	857.5		550	20	4
	Consumer-SU21	PC31:Polishes and wax blends	Polishes, spray (furniture, shoes)	0.5	A		A	S	1	857.5		135	20	4
	Consumer-SU21	PC34_n: Textile dyes, finishing and impregnating products		0.1	A		A		1	857.5		115	20	1

TRA+

Table 1: Mapping Consumer Uses in the Supply Chain				Table 2b: Characterising the Risk - after refinement of exposure estimate																								
				all		all		dermal		dermal		dermal		dermal	oral		inhalation		inhalation		inhalation	inhalation		inhalation	inhalation		inhalation	
Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels	TIER1+ ECETOC TRA - exposure modifiers																								
Short Title	Area of Application / UD			Product ingredient (weight fraction) (g/g)		Frequency (events per day): if < 1, only used for chronic assessment		Skin surface contact area (cm2)		Use Dilution Factor		Dermal Factor		Glove effiency	Amount Swallowed (g)		Amount Used per event (g)		Inhalation Factor (fraction of total use spilled/evaporated, i.e., amount lost)		Location (indoors, outdoors, garage)	Air Exchange Rate (1/hr)		Dilution Factor incorporating Air Exchange Rate applied to TRA for mg/kg inhalation calc	Room Volume (m3)		Exposure time (hours)	
				Value	Comments	Value	Comments	Value	Comments	Value	Comments	Value	Comments		Value	Comments	Value	Comments	Value	Comments		Value	Comments		Value	Comments	Value	Comments
Coating	Consumer-SU21	PC1:Adhesives, sealants	Glues, hobby use	0.3	TRA default	1	TRA default	35.7291667	TRA default			0.0027					9	TRA default			indoor, typical	0.6	RIVM general fact sheet	0.379	20	TRA default	4	TRA default
Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.	Consumer-SU21	PC1:Adhesives, sealants	Glues DIY-use (carpet glue, tile glue, wood parquet glue)	0.3	TRA default	0.0027	RIVM do it yourself use, parquest and floor glue all < 1/yr, here used 1/yr	110	RIVM; (however, est. 35.7 fingertips may be more realistic for an adhesive product)			0.0040					6390	internet search indicates 50-200 square feet coverage per gallon for floor glue. for a 20 m3 room = 705 feet3, assuming 8' in height, gives a floor area of 88 square feet and would use at most 1.76 gallons (6390 grams); wall paper glue at 280 ft/gallon and assuming wall surface of 304 sq ft would be 1.1 gallons . Ref 3			indoor, typical	0.6	RIVM general fact sheet	0.270	20	TRA default	6	TRA default
PC1, PC4, PC8, PC9, PC15, PC18, PC23, PC24, PC31, PC34, (PC5, PC10)	Consumer-SU21	PC1:Adhesives, sealants	Glue from spray	0.3	TRA default	0.016438356	USEPA 2009 draft EFH Table 17-4, 75th percentile adhesive use	35.7291667	TRA default			0.0027					85.05	USEPA 2009 draft EFH indicates 75th percentile adhesive use/year is 3 oz; used this as consistent with spray glue can size of 4 oz and more than one use			indoor, typical	0.6	RIVM general fact sheet	0.379	20	TRA default	4	TRA default
	Consumer-SU21	PC1:Adhesives, sealants	Sealants	0.3	TRA default	1	TRA default	35.7291667	TRA default			0.0007					75	RIVM joint selant			indoor, typical	0.6	RIVM general fact sheet	0.752	20	TRA default	1	The 95th percentile for adhesive exposure time USEPA EFH 2009 draft Table 17-5
	Consumer-SU21	PC4_n:Anti-freeze and de-icing products	Washing car window	0.01	ACC cites an EU RA	1	estimated as conservative frequency used in a garage										0.5	ACC cites an EU RA			garage	1.5	RIVM general fact sheet	0.988	34	RIVM general fact sheet	0.017	ACC cites an EU RA
	Consumer-SU21	PC4_n:Anti-freeze and de-icing products	Pouring into radiator	0.1	estimated as 10 times concentration used in ACC windscreen scenario	1	conservative estimate assumes as daily use	428	based upon 1 hand			0.0003					2000	estimated about half of a typical container	0.05	estimate 5% lost during pouring	garage	1.5	RIVM general fact sheet	0.885	34	RIVM general fact sheet	0.167	estimated time pouring into reservoir
		PC4_n:Anti-freeze and de-icing products	Lock de-icer	0.5	estimated based upon use as a common TRA default	1	conservative estimate assumes as daily use	214.4	est. fingers of one hand			0.0001					4	est. amount of one spray into a lock; internet search indicates lock deicers sold in about 20 g sizes; note windshield de-icer sold in larger sizes (11 oz) but would only be needed on a vehicle parked outdoors			garage	1.5	RIVM general fact sheet	0.834	34	RIVM general fact sheet	0.25	estimated time to spray and open lock
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Laundry and dish washing products	0.05	RIVM	1	TRA default	857.5	TRA default	0.01	est. 100-fold diln with water (AISE indicates 10 mg/cm3 product conc. in washwater)	0.002					15	5 from EFH dishwashing; laundry liquid 150 g in HERA - est. 90% down the drain, exposure to 15 g			indoor, typical	0.6	RIVM general fact sheet	0.864	20	TRA default	0.5	HERA dish washing duration (greater than laundry duration)
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	0.05	RIVM	0.35	EFH 2009 mean use frequency, table 17-37 liquid all purpose cleaner	857.5	TRA default	1	(up to 1 in AISE)	0.0013	Previously used"1" as dermal transfer factor (up to I in AISE)				27	EFH 2009 mean liquid purpose cleaner			indoor, typical	0.6	RIVM general fact sheet	0.907	20	TRA default	0.33	EFH 2009
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	0.15	RIVM	0.35	EFH 2009 mean use frequency, table 17-37 liquid all purpose cleaner	428	est. lower skin contact for spray than liquid, wiping with one hand			0.0002					35	TRA default			indoor, typical	0.6	RIVM general fact sheet	0.952	20	TRA default	0.17	HERA and SDA maximum use time
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Waterborne latex wall paint	0.015	RIVM paint fact sheet solvent percentage	0.011	RIVM paint fact sheet	428.75	TRA default			0.0293					2760	est. 400 sq ft per gallon, for walls of 20 m3 room est. 304 sq ft or 0.76 gallons = 2760 g; consistent with EPA 2009 EFH 75th percentile			indoor, typical	0.6	RIVM general fact sheet	0.555	20	TRA default	2.2	TRA default
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Solvent rich, high solid, water borne paint	0.275	RIVM paint fact sheet	0.016	RIVM paint fact sheet	428.75	TRA default			0.0016					744	EFH 2009 75th percentile oil paint			indoor, typical	0.6	RIVM general fact sheet	0.555	20	TRA default	2.2	TRA default
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Aerosol spray can	0.5	TRA default	0.005	RIVM 2 uses per year										215	EFH 2009 75th percentile spray paint			garage	1.5	RIVM general fact sheet	0.789	34	RIVM general fact sheet	0.33	TRA default
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Removers (paint-, glue-, wall paper-, sealant-remover)	0.5	RIVM paint fact sheet	0.008219178	EPA EFH 75th percentile table 17-4 paint removers	857.5	TRA default			0.0008					491	EFH 2009 75th percentile			indoor, typical	0.6	RIVM general fact sheet	0.582	20	TRA default	2	EPA EFH 2009 75th percentile
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Fillers and putty	0.02	Est. -Product function requires product to remain, expect <solvent amount in water borne paint	0.032876712	infrequent use, est 12/yr	35.7291667	TRA default			0.04					85	Est. 3 oz consumer use (internet search indicates tubes sold in 1 and 3 oz sizes).			indoor, typical	0.6	RIVM general fact sheet	0.379	20	TRA default	4	TRA default
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Plasters and floor equalizers	0.02	Product function requires product to remain, expect <solvent amount in water borne paint	0.032876712	infrequent use, est 12/yr	857.5	TRA default			0.02					13800	internet search indicates about 7.5 L (13.8 kg) ready to roll plaster to cover 31 m2 aurface area (est. walls of 20 m3 room)			indoor, typical	0.6	RIVM general fact sheet	0.582	20	TRA default	2	TRA default
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Modelling clay	0.01	Est. solvent concentration	1	TRA default	254.4	TRA default				previously used "0.05" as dermal transfer factor; as clays are solid, based upon EPA 600/R-07/040F transfer factor for treated surfaces		1	TRA default												
	Consumer-SU21	PC9c:Finger paints	Finger paints	0.5	TRA default	1	TRA default	254.4	TRA default						1.35	TRA default												
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Waterborne latex wall paint	0.015	RIVM paint fact sheet solvent percentage	0.011	RIVM paint fact sheet	428.75	TRA default			0.0293					2760	est. 400 sq ft per gallon, for walls of 20 m3 room est. 304 sq ft or 0.76 gallons = 2760 g; consistent with EPA 2009 EFH 75th percentile			indoor, typical	0.6	RIVM general fact sheet	0.555	20	TRA default	2.2	TRA default
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Solvent rich, high solid, water borne paint	0.275	RIVM paint fact sheet	0.016	RIVM paint fact sheet	428.75	TRA default			0.0016					744	EFH 2009 75th percentile oil paint			indoor, typical	0.6	RIVM general fact sheet	0.555	20	TRA default	2.2	TRA default
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Aerosol spray can	0.5	TRA default	0.005	RIVM 2 uses per year										215	EFH 2009 75th percentile spray paint			garage	1.5	RIVM general fact sheet	0.789	34	RIVM general fact sheet	0.33	TRA default
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Removers (paint-, glue-, wall paper-, sealant-remover)	0.5	RIVM paint fact sheet	0.008219178	EPA EFH 75th percentile table 17-4 paint removers	857.5	TRA default			0.0008					491	EFH 2009 75th percentile			indoor, typical	0.6	RIVM general fact sheet	0.582	20	TRA default	2	EPA EFH 2009 75th percentile
	Consumer-SU21	PC18_n: Ink and toners	Inks and toners.	0.1	est. solvent conc.	1	conservative assumption daily use	71.4	fingertips of 2 hands (contact with paper or during cartridge transfer)			0.0044					40	internet search indicates ink cartridges range from 9-40 g, assume entire one used			indoor, typical	0.6	RIVM general fact sheet	0.555	20	TRA default	2.2	est. several hundred pages may be print out over this time period
	Consumer-SU21	PC23_n: Leather tanning, dye, finishing, impregnation and care products	Polishes, wax / cream (floor, furniture, shoes)	0.5	PC 31 TRA default	0.08	PC31 value	430	PC 31 RIVM - furniture cream polish			0.0005					56	est. 56 g/use as internet search indicates leathercare sold in 3-4 oz liquids and sprays, est. about 1/2 per use			indoor, typical	0.6	RIVM general fact sheet	0.707	20	TRA default	1.23	EFH 2009 75th percentile wood panel cleaner
	Consumer-SU21	PC23_n: Leather tanning, dye, finishing, impregnation and care products	Polishes, spray (furniture, shoes)	0.5	PC 31 TRA default	0.021917808	PC31 value	430	PC 31 RIVM - furniture cream polish			0.0001					56	est. 56 g/use as internet search indicates leathercare sold in 3-4 oz liquids and sprays, est. about 1/2 per use			indoor, typical	0.6	RIVM general fact sheet	0.906	20	TRA default	0.33	EFH 2009 75th percentile spray shoe polish
	Consumer-SU21	PC24: Lubricants, greases, and release products	Liquids	1	increased above TRA default	0.010958904	EPA EFAST model motor oil	468	EPA EFAST 7.8 cm2/kg, adjusted to 60 kg			0.0000					2200	Est changing 2 quarts (2200 g)	0.01	est. loss of <1% total product used via spillage or evaporation	garage	1.5	RIVM general fact sheet	0.885	34	RIVM general fact sheet	0.17	EPA EFH 2009 75th percentile
	Consumer-SU21	PC24: Lubricants, greases, and release products	Pastes	0.2	TRA default	0.02739726	EFH 2009 Table 17-4	468	TRA default								34	EFH 2009 75th percentile use 1.2 oz/use										
	Consumer-SU21	PC24: Lubricants, greases, and release products	Sprays	0.5	TRA default	0.016438356	EFH 2009 spray lubricants for cars, 75th percentile	428.75	TRA default			0.0001					73	EFH 2009 75th percentile			indoor, typical	0.6	RIVM general fact sheet	0.952	20	TRA default	0.17	EPA EFH 2009 75th percentile, Table 17-5
	Consumer-SU21	PC31:Polishes and wax blends	Polishes, wax / cream (floor, furniture, shoes)	0.5	TRA default	0.08	RIVM	430	RIVM - furniture cream polish			0.0005					142	EPA EFH 2009 furniture cream			indoor, typical	0.6	RIVM general fact sheet	0.707	20	TRA default	1.23	EFH 2009 75th percentile wood panel cleaner
	Consumer-SU21	PC31:Polishes and wax blends	Polishes, spray (furniture, shoes)	0.5	TRA default	0.021917808	EFH 2009 spray shoe polish, 75th percentile	430	as above, although expect lower because spray			0.0001					35	EFH 2009, 75th percentile shoe polish			indoor, typical	0.6	RIVM general fact sheet	0.906	20	TRA default	0.33	EFH 2009 75th percentile spray shoe polish
	Consumer-SU21	PC34_n: Textile dyes, finishing and impregnating products		0.1	est. solvent conc.	1	Common TRA defaults	857.5	est. 2 hands contact	0.01	internet search indicates 4 oz liquid dye added to 3 gallons of water (= 0.01 dilution factor)	0.0020					115	est. 4 oz (115 g) per event based upon internet use information			indoor, typical	0.6	RIVM general fact sheet	0.752	20	TRA default	1	internet indicates clothing can remain in dye bath up to 1 hour

1.2 Uses in Cleaning – Consumer

TRA

Table 1: Mapping Consumer Uses in the Supply Chain				Table 2a: Characterising the Risk - based on defaults (ECETOC TRA Consumers)											
				all	all			all		d	o	i	i	i	
Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels	Product ingredient (g/g)	adult / child			Product is spray? (S)	frequency (events per day)	Skin surface contact area (cm2)	Amount Swallowed (g)	Amount Used per event (g)	room volume (m3)	exposure time (hr)	
Short Title	Area of Application / UD				d	o	i								
Cleaning	Consumer-SU21	PC3:Air care products	Air care, instant action (aerosol sprays)	0.5			A	S	4			10	20	0.25	
Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products.	Consumer-SU21	PC3:Air care products	Air care, instant action (aerosol sprays)-pesticidal-excipient only	0.5			A	S	4			10	20	0.25	
PC3, PC4, PC8 (excipient only), PC9, PC24, PC35, PC38	Consumer-SU21	PC3:Air care products	Air care, continuous action (solid and liquid)	0.1	A		A		1	35.7		50	20	8	
	Consumer-SU21	PC3:Air care products	Air care, continuous action (solid and liquid)-pesticidal-excipient only	0.1	A		A		1	35.7		50	20	8	
	Consumer-SU21	PC4_n:Anti-freeze and de-icing products	Washing car window	0.01			A		1			0.5	34	0.0167	
	Consumer-SU21	PC4_n:Anti-freeze and de-icing products	Pouring into radiator	0.1	A		A		1	857.5		2000	34	0.1667	
		PC4_n:Anti-freeze and de-icing products	Lock de-icer	0.5	A		A	S	1	214.4		4	34	0.25	
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Laundry and dish washing products	0.6	A		A		1	857.5		50	20	1	
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	0.5	A		A		1	857.5		250	20	0.333	
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	0.2	A		A	S	1	857.5		35	20	4	
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Waterborne latex wall paint	0.5	A		A		1	428.75		3750	20	2.2	
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Solvent rich, high solid, water borne paint	0.5	A		A		1	428.75		1300	20	2.2	
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Aerosol spray can	0.5			A	S	1			300	20	0.333	
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Removers (paint-, glue-, wall paper-, sealant-remover)	0.9	A		A		1	857.5		2000	20	4	
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Fillers and putty	1	A		A		1	35.72916667		1000	20	4	
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Plasters and floor equalizers	1	A		A		1	857.5		25000	20	2	
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Modelling clay	0.1	C	C			1	254.4	1		20		
	Consumer-SU21	PC9c:Finger paints	Finger paints	0.5	C	C			1	254.4	1.35		20		
	Consumer-SU21	PC24: Lubricants, greases, and release products	Liquids	0.5	A		A		1	857.5		5000	20	4	
	Consumer-SU21	PC24: Lubricants, greases, and release products	Pastes	0.2	A				1	857.5			20		
	Consumer-SU21	PC24: Lubricants, greases, and release products	Sprays	0.5	A		A	S	1	428.75		300	20	4	
	Consumer-SU21	PC35:Washing and cleaning products (including solvent based products)	Laundry and dish washing products	0.6	A		A		1	857.5		50	20	1	
	Consumer-SU21	PC35:Washing and cleaning products (including solvent based products)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	0.5	A		A		1	857.5		250	20	0.333	
	Consumer-SU21	PC35:Washing and cleaning products (including solvent based products)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	0.2	A		A	S	1	857.5		35	20	4	
	Consumer-SU21	PC38_n: Welding and soldering products, flux products	NOTE, n_assessment not in TRA	0.2			A		1			12	20	1	

TRA+

Table 1: Mapping Consumer Uses in the Supply Chain				Table 2b: Characterising the Risk - after refinement of exposure estimate																													
				all		all		dermal		dermal		dermal		dermal	oral	inhalation		inhalation		inhalation		inhalation		inhalation									
				TIER1+ ECETOC TRA - exposure modifiers																													
Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels	Product ingredient (weight fraction) (g/g)		Frequency (events per day): if < 1, only used for chronic assessment		Skin surface contact area (m2)		Use Dilution Factor		Dermal Factor		Glove effiency	Amount Swallowed (g)		Amount Used per event (g)		Inhalation Factor (fraction of total use spilled/evaporated, i.e., amount lost)		Location (indoors, outdoors, garage)	Air Exchange Rate (1/hr)		Dilution Factor incorporating Air Exchange Rate applied to TRA for mg/kg-inhalation calc.	Room Volume (m3)	
Short Title	Area of Application / LID			Value	Comments	Value	Comments	Value	Comments	Value	Comments	Value	Comments		Value	Comments	Value	Comments	Value	Comments			Value	Comments		Value	Comments
Cleaning	Consumers: SU21	PC3:Air care products	Air care, instant action (aerosol sprays)	0.5	TRA default	4	TRA default										0.1	internet search indicates 12.2g spray upon motion lasts up to 30days; so 0.4g/day or 0.1g/event if 4/day			indoor, typical	0.6	RIVM general fact sheet		0.9286	20	TRA default
Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products.	Consumers: SU21	PC3:Air care products	Air care, instant action (aerosol sprays)- pesticidal- excipient only	0.5	TRA default	4	TRA default										5	internet search for air freshener indicates 12.2g spray upon motion lasts up to 30days; so 0.4g/day or 0.1g/event if 4/day; value increased to account for other spray applications			indoor, typical	0.6	RIVM general fact sheet		0.9286	20	TRA default
PC3, PC4, PC8 (excipient only), PC9, PC24, PC35, PC38	Consumers: SU21	PC3:Air care products	Air care, continuous action (solid and liquid)	0.1	TRA default	1	TRA default	35.7	TRA default			0.16					0.48	inernet search indicates 14.4g plug-in lasts 30days; so 0.48g/day			indoor, typical	0.6	RIVM general fact sheet		0.2066	20	TRA default
	Consumers: SU21	PC3:Air care products	Air care, continuous action (solid and liquid)- pesticidal- excipient only	0.5	increased value from TRA default	1	TRA default	35.7	TRA default			0.0032					0.48	internet search for air freshener indicates 14.4g plug-in lasts 30days; so 0.48g/day			indoor, typical	0.6	RIVM general fact sheet		0.2066	20	TRA default
	Consumers: SU21	PC4_n:Anti-freeze and de-icing products	Washing car window	0.01	ACC cites an EU RA	1	estimated as conservative frequency used in a garage										0.5	ACC cites an EU RA			garage	1.5	RIVM general fact sheet		0.9876	34	RIVM general fact sheet
	Consumers: SU21	PC4_n:Anti-freeze and de-icing products	Pouring into radiator	0.1	estimated as 10 times concentration used in ACC windscreen scenario	1	conservative estimate assumes as daily use	428	based upon 1 hand			0.00033333					2000	estimated about half of a typical container	0.05	estimate 5% lost during pouring	garage	1.5	RIVM general fact sheet		0.8848	34	RIVM general fact sheet
		PC4_n:Anti-freeze and de-icing products	Lock de-icer	0.5	estimated based upon use as a common TRA default	1	conservative estimate assumes as daily use	214.4	est. fingers of one hand			0.0001					4	est. amount of one spray into a lock; internet search indicates lock deicers sold in about 20 g sizes; note windshield de-icer sold in larger sizes (11 oz) but would only be needed on a vehicle parked outdoors			garage	1.5	RIVM general fact sheet		0.8339	34	RIVM general fact sheet
	Consumers: SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Laundry and dish washing products	0.05	RIVM	1	TRA default	857.5	TRA default	0.01	est. 100-fold dilution with water (AISE indicates 1:0 mg/cm3 product conc. in washwater)	0.002					15	5 from EFH dishwashing; laundry liquid 150 g in HERA - est. 90% down the drain, exposure to 15 g			indoor, typical	0.6	RIVM general fact sheet		0.8639	20	TRA default
	Consumers: SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	0.05	RIVM	0.35	EFH 2009 mean use frequency, table 17-37 liquid all purpose cleaner	857.5	TRA default	1	(up to 1 in AISE)	0.00132	Previously used"1" as dermal transfer factor (up to 1 in AISE)				27	EFH 2009 mean liquid purpose cleaner			indoor, typical	0.6	RIVM general fact sheet		0.9072	20	TRA default
	Consumers: SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	0.15	RIVM	0.35	EFH 2009 mean use frequency, table 17-37 liquid all purpose cleaner	428	est. lower skin contact for spray than liquid, wiping with one hand			0.00022222					35	TRA default			indoor, typical	0.6	RIVM general fact sheet		0.9516	20	TRA default
	Consumers: SU21	PC9a:Coatings and paints, fillers putties, thinners	Waterborne latex wall paint	0.015	RIVM paint fact sheet:solvent percentage	0.011	RIVM paint fact sheet	428.75	TRA default			0.02933333					2760	est. 400 sq ft per gallon, for walls of 20 m3 room est. 304 sq ft or 0.76 gallons = 2760 g; consistent with EPA 2009 EFH 75th percentile			indoor, typical	0.6	RIVM general fact sheet		0.5552	20	TRA default
	Consumers: SU21	PC9a:Coatings and paints, fillers putties, thinners	Solvent rich, high solid, water borne paint	0.275	RIVM paint fact sheet	0.016	RIVM paint fact sheet	428.75	TRA default			0.0016					744	EFH 2009 75th percentile oil paint			indoor, typical	0.6	RIVM general fact sheet		0.5552	20	TRA default
			Tier 2: ConsExpo estimates																														
	Consumers: SU21	PC9a:Coatings and paints, fillers putties, thinners	Aerosol spray can	0.5	TRA default	0.005	RIVM 2 uses per year										215	EFH 2009 75th percentile spray paint			garage	1.5	RIVM general fact sheet		0.7887	34	RIVM general fact sheet
	Consumers: SU21	PC9a:Coatings and paints, fillers putties, thinners	Removers (paint-, glue-, wall paper-, sealant-remover)	0.5	RIVM paint fact sheet	0.008219178	EPA EFH 75th percentile table 17-4 paint removers	857.5	TRA default			0.0008					491	EFH 2009 75th percentile			indoor, typical	0.6	RIVM general fact sheet		0.5823	20	TRA default
	Consumers: SU21	PC9b:Fillers, putties, plasters, modeling clay	Fillers and putty	0.02	Est. -Product function requires product to remain, expect <solvent amount in water borne paint	0.032876712	infrequent use, est 12/yr	35.72916667	TRA default			0.04					85	Est. 3 oz consumer use (internet search indicates tubes sold in 1 and 3 oz sizes).			indoor, typical	0.6	RIVM general fact sheet		0.3789	20	TRA default
	Consumers: SU21	PC9b:Fillers, putties, plasters, modeling clay	Plasters and floor equalizers	0.02	Product function requires product to remain, expect <solvent amount in water borne paint	0.032876712	infrequent use, est 12/yr	857.5	TRA default			0.02					13800	internet search indicates about 7.5 L (13.8 kg) ready to roll plaster to cover 31 m2 surface area (est. walls of 20 m3 room)			indoor, typical	0.6	RIVM general fact sheet		0.5823	20	TRA default
	Consumers: SU21	PC9b:Fillers, putties, plasters, modeling clay	Modelling clay	0.01	Est. solvent concentration	1	TRA default		TRA default				previously used "0.05" as dermal transfer factor,as clays are solid, based upon EPA 600/R-07/040F transfer factor for treated surfaces		1	TRA default														
	Consumers: SU21	PC9c:Finger paints	Finger paints	0.5	TRA default	1	TRA default	254.4	TRA default						1.35	TRA default														
	Consumers: SU21	PC24: Lubricants, greases, and release products	Liquids	1	increased above TRA default	0.010958904	EPA EFAST model motor oil	468	EPA EFAST 7.8 cm2/kg, adjusted to 60 kg			3.3333E-05					2200	Est changing 2 quarts (2200 g)	0.01	est. loss of <1% total product used via spillage or evaporation	garage	1.5	RIVM general fact sheet		0.8848	34	RIVM general fact sheet
	Consumers: SU21	PC24: Lubricants, greases, and release products	Pastes	0.2	TRA default	0.02739726	EFH 2009 Table 17-4	468	TRA default								34	EFH 2009 75th percentile use 1.2 oz/use									
	Consumers: SU21	PC24: Lubricants, greases, and release products	Sprays	0.5	TRA default	0.016438356	EFH 2009 spray lubricants for cars, 75th percentile	428.75	TRA default			6.66667E-05					73	EFH 2009 75th percentile			indoor, typical	0.6	RIVM general fact sheet		0.9516	20	TRA default
	Consumers: SU21	PC35:Washing and cleaning products (including solvent based products)	Laundry and dish washing products	0.05	RIVM	1	TRA default	857.5	TRA default	0.01	est. 100-fold dilution with water (AISE indicates 1:0 mg/cm3 product conc. in washwater)	0.002					15	5 from EFH dishwashing; laundry liquid 150 g in HERA - est. 90% down the drain, exposure to 15 g			indoor, typical	0.6	RIVM general fact sheet		0.8639	20	TRA default
	Consumers: SU21	PC35:Washing and cleaning products (including solvent based products)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	0.05	RIVM	0.35	EFH 2009 mean use frequency, table 17-37 liquid all purpose cleaner	857.5	TRA default	1	(up to 1 in AISE)	0.00132	previously used "1" as dermal transfer factor (up to 1 in AISE)				27	EFH 2009 mean liquid purpose cleaner			indoor, typical	0.6	RIVM general fact sheet		0.9072	20	TRA default
	Consumers: SU21	PC35:Washing and cleaning products (including solvent based products)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	0.15	RIVM	0.35	EFH 2009 mean use frequency, table 17-37 liquid all purpose cleaner	428	est. lower skin contact for spray than liquid, wiping with one hand			0.00022222					35	TRA default			indoor, typical	0.6	RIVM general fact sheet		0.9516	20	TRA default
	Consumers: SU21	PC38_n: Welding and soldering products, flux products	NOTE, n_assessment not in TRA	0.2	est. weight fraction	1	daily use assumed		contains acids, sold with brushes or applicators so no dermal exposure expected								12	est. 3 seals at 4 g/seal for a small room			indoor, typical	0.6	RIVM general fact sheet		0.7520	20	TRA default

1.3 Use as a Fuel – Consumer

TRA

Table 1: Mapping Consumer Uses in the Supply Chain				Table 2a: Characterising the Risk - based on defaults (ECETOC TRA Consumers)										
				all	all				all	d	o	i	i	i
Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels	Product ingredient (g/g)	adult / child				frequency (events per day)	Skin surface contact area (cm2)	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	Consumer-SU21	PC13:Fuels	Liquid - subcategories added: Automotive Refuelling	0.5	A		A		1	857.50		5000	20	4
PC13	Consumer-SU21	PC13:Fuels	Liquid - subcategories added: Scooter Refuelling	0.5	A		A		1	857.50		5000	20	4
	Consumer-SU21	PC13:Fuels	Liquid - subcategories added: Garden Equipment - Use	0.5			A		1	857.5		5000	20	4.000
	Consumer-SU21	PC13:Fuels	Liquid (subcategories added): Garden Equipment - Refueling	0.5	A		A		1	857.5		5000	20	4
		PC13:Fuels	Liquid (subcategories added): Home space heater fuel	0.5	A		A		1	857.5		5000	20	4.00
	Consumer-SU21	PC13:Fuels	Liquid - subcategories added: Lamp oil	0.5	A		A		1	857.5		5000	20	4

TRA+

Table 1: Mapping Consumer Uses in the Supply Chain				Table 2b: Characterising the Risk - after refinement of exposure estimate									
				all		all		dermal		dermal		dermal	
Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels										
Short Title	Area of Application / UD			Product ingredient (weight fraction) (g/g)		Frequency (events per day): if < 1, only used for chronic assessment		Skin surface contact area (cm2)		Use Dilution Factor		Dermal Factor	
				Value	Comments	Value	Comments	Value	Comments	Value	Comments	Value	Comments
Fuels	Consumer-SU21	PC13:Fuels	Liquid - subcategories added: Automotive Refuelling	1	increased above TRA default	0.143	est. as 1 per week	210	est. as palm of one hand			0.000010	
PC13	Consumer-SU21	PC13:Fuels	Liquid - subcategories added: Scooter Refuelling	1	increased above TRA default	0.143	est. as 1 per week	210	est. as palm of one hand			0.000007	
	Consumer-SU21	PC13:Fuels	Liquid - subcategories added: Garden Equipment - Use	1	increased above TRA default	0.07	est. as 1 per two weeks						
	Consumer-SU21	PC13:Fuels	Liquid (subcategories added): Garden Equipment - Refueling	1	increased above TRA default	0.07	est. as 1 per two weeks	420	Est. half of each hand			0.000006	
		PC13:Fuels	Liquid (subcategories added): Home space heater fuel	1	increased above TRA default	1	est. as daily	210	est. as palm of one hand			0.000006	
	Consumer-SU21	PC13:Fuels	Liquid - subcategories added: Lamp oil	1	increased above TRA default	0.143	est. as 1 per week	210	est. as palm of one hand			0.000003	

Product sub Category Sentinels	Glove effiency	Amount Swallowed (g)		Amount Used per event (g)		Inhalation Factor (fraction of total use spilled/evaporated, i.e., amount lost)		Location (indoors, outdoors, garage)	Air Exchange Rate (1/hr)		Dilution Factor incorporating Air Exchange Rate applied to TRA for mg/kg inhalation calc.	Room Volume (m3)		Exposure time (hours)	
	dermal	oral		inhalation		inhalation		inhalation	inhalation		inhalation	inhalation		inhalation	
	TIER1+ ECETOC TRA - exposure modifiers														
		Value	Comments	Value	Comments	Value	Comments		Value	Comments		Value	Comments	Value	Comments
Liquid - subcategories added: Automotive Refuelling				37500	est. fuel tank size 50 L converted using gasoline density of 750 kg/m3	0.002	expect low % loss during refueling due to evaporation /spill	outdoor	0.6	est. conservative value for outdoor	0.985	100	Stoffenmanager volume used for outdoors	0.05	3mins, 97th percentile-Vainiotalo et al. 1999
Liquid - subcategories added: Scooter Refuelling				3750	est. fuel tank size 5 L converted using gasoline density of 750 kg/m3	0.02	expect low % loss during refueling but more than for automotive	outdoor	0.6	est. conservative value for outdoor	0.990	100	Stoffenmanager volume used for outdoors	0.033	2mins, Est. as shorter than vehicle
Liquid - subcategories added: Garden Equipment - Use				750	1 L: Conv from L to g based upon density for mogas = 750 kg/m3.	0.02	expect low % loss during equipment use	outdoor	0.6	est. conservative value for outdoor	0.582	100	Stoffenmanager volume used for outdoors	2.000	Est. 2 hours per day
Liquid (subcategories added): Garden Equipment - Refueling				750	1 L: Conv from L to g based upon density for mogas = 750 kg/m3.	0.03	expect low % loss but may be more from pouring than using filling station equipment	garage	1.5	RIVM general fact sheet	0.978	34	RIVM general fact sheet	0.03	Est. 2mins
Liquid (subcategories added): Home space heater fuel				3000	4 L: Conv from L to g based upon density for mogas = 750 kg/m3.	0.00125	expect low amount (5 ml max) spilled during pouring in residence	indoor, typical	0.6	RIVM general fact sheet	0.991	20	TRA default	0.03	Est. 2mins
Liquid - subcategories added: Lamp oil				100	0.13L: Conv from L to g based upon density for mogas = 750 kg/m3.	0.05	expect low loss but % increased because lower use volume	indoor, typical	0.6	RIVM general fact sheet	0.996	20	TRA default	0.01	Est. 0.75 min

1.4 Other uses – Consumer

Table not applicable

Appendix 2a
Exposure estimation – worker

1.1 Manufacture of Substance – Industrial

Table 1: Mapping Uses in the Supply				Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use									
				Use Descriptor	Inhalatory exposure			Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	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**	Comments
Manufacture of substance	Industrial - SU8/9/3	General process exposures (no sampling)	CS15	PROC1 Closed process (no sampling)	0.03		0.03	0.34			0.34		
	Industrial - SU8/9/3	General process exposures and sample collection	CS15	PROC2 Closed continuous process (with sampling)	147.24		147.24	1.37			1.37		
	Industrial - SU8/9/3	General process exposures	CS15	PROC3 Closed batch process (with sampling)	294.48		294.48	0.34			0.34		
	Industrial - SU8/9/3	General exposures open batch process	CS16	PROC4 batch process with exposure	294.48		294.48	6.86			6.86		
	Industrial - SU8/9/3	Sample collection	CS2	PROC8b Dedicated discharging to/from vessels	441.72		441.72	6.86			6.86		
	Industrial - SU8/9/3	Laboratory activities	CS36	PROC15 Use in laboratory	147.24		147.24	0.34			0.34		
	Industrial - SU8/9/3	Bulk transfers (no lev)	CS14, CS108	PROC8b Dedicated discharging to/from vessels	441.72		441.72	6.86			6.86		
	Industrial - SU8/9/3	Bulk transfers (with lev)	CS14, CS107	PROC8b Dedicated discharging to/from vessels	441.72		441.72	6.86			6.86		
	Industrial - SU8/9/3	Clean down and Maintenance	CS39	PROC8a Non-dedicated discharging to/from vessels	736.20		736.20	13.71			13.71		
	Industrial - SU3 / SU10	Storage	CS67	PROC1 Closed process (no sampling)	0.03		0.03	0.34			0.34		
	Industrial - SU3 / SU10	Storage	CS67	PROC2 Closed continuous process (with sampling)	147.24		147.24	1.37			1.37		

1.2 Distribution of Substance – Industrial

	Table 1: Mapping Uses			Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use										
				Use Descriptor	Inhalatory exposure			Dermal exposure						
	User Group	Contributing Scenarios	CS Ref	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**	Comments
Distribution of substance	Industrial - SU3	General process exposures - closed process (e.g. In-line additive dosing equipment, in-line filter cleaning)	CS15	PROC1 Closed process (no sampling)	0.03		0.03	0.34			0.34		
	Industrial - SU3	General process exposures (occasional controlled exposure)	CS15	PROC2 Closed continuous process (with sampling)	147.24		147.24	1.37			1.37		
	Industrial - SU3	General process exposures - closed batch process	CS15	PROC3 Closed batch process (with sampling)	294.48		294.48	0.34			0.34		
	Industrial - SU3	General exposures open batch process	CS16	PROC4 batch process with exposure	294.48		294.48	6.86			6.86		
	Industrial - SU3	Sample collection	CS2	PROC3 Closed batch process (with sampling)	294.48		294.48	0.34			0.34		
	Industrial - SU3	Laboratory activities	CS36	PROC15 Use in laboratory	147.24		147.24	0.34			0.34		
Combine in narrative as Bulk Transfer CS14 unless differentiation required in practice	Industrial - SU3	Bulk closed loading and unloading NEW CS (e.g. road/rail car bottom loading/unloading; marine vessel/barge loading/unloading;)	CS14, CS107 Bulk transfers (closed systems)	PROC8b Dedicated Discharging to/from vessels	441.72		441.72	6.86			6.86		
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)	PROC8b Dedicated discharging to/from vessels	441.72		441.72	6.86			6.86		
	Industrial - SU3	Drum and small package filling	CS6	PROC9 Transfer of substance/mixture into small containers	588.96		588.96	6.86			6.86		
	Industrial - SU3	Clean down and Maintenance	CS39	PROC8a Non-dedicated discharging to/from vessels	736.20		736.20	13.71			13.71		
	Industrial - SU3	Storage	CS67	PROC1 Closed continuous process (sometimes with sampling)	0.03		0.03	0.34			0.34		
	Industrial - SU3	Storage	CS67	PROC2 Closed continuous process (sometimes with sampling)	147.24		147.24	1.37			1.37		

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

Table 1: Mapping Uses				Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use									
				Use Descriptor	Inhalatory exposure			Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	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**	Comments
Formulation & (re)packing of substances and mixtures	Industrial - SU3/SU10	General process exposures (no sampling) (e.g. In-line additive dosing equipment, in-line filter cleaning)	CS15	PROC1 Closed process (no sampling)	0.03		0.03	0.34			0.34		
	Industrial - SU3/SU10	General process exposures and sample collection	CS15	PROC2 Closed continuous process (with sampling)	147.24		147.24	1.37			1.37		
	Industrial - SU3/SU10	General process exposures (e.g. In-line additive dosing equipment, in-line filter cleaning)	CS15	PROC3 Closed batch process (with sampling)	294.48		294.48	0.34			0.34		
	Industrial - SU3/SU10	General exposures open batch process	CS16	PROC4 batch process with exposure	294.48		294.48	6.86			6.86		
Elevated temperature therefore applied value for medium volatility	Industrial - SU3/SU10	Batch processes at **elevated temperatures** (e.g. solvents resin manufacture, grease manufacture)	CS136	PROC3 Closed batch process (with sampling)	6625.00	Vent (0.7)	1987.50	0.34			0.34		15% of LEL has been applied for Tier 1 predicted exposure estimate due to elevated temperature
	Industrial - SU3/SU10	Sample collection	CS2	PROC3 Closed batch process (with sampling)	294.48		294.48	0.34			0.34		
	Industrial - SU3/SU3	Laboratory activities	CS36	PROC15 Use in laboratory	147.24		147.24	0.34			0.34		
	Industrial - SU3/SU10	Bulk transfers	CS14	PROC8b Dedicated discharging to/from vessels	441.72		441.72	6.86			6.86		
	Industrial - SU3/SU10	Mixing operations (open systems)	CS30	PROC5 Mixing or blending	736.20		736.20	13.71			13.71		
	Industrial - SU3/SU10	Transfer from/pouring from containers , Manual	CS34 + CS22	PROC8a Non-dedicated discharging to/from vessels	736.20		736.20	13.71			13.71		
	Industrial - SU3/SU10	Drum/Batch transfers	CS8	PROC8b Dedicated discharging to/from vessels	441.72		441.72	6.86			6.86		
	Industrial - SU3/SU10	Tabletting, compression, extrusion or pelletisation	CS100	PROC14 Production of preparation by tabletting, compression, extrusion, pelletisation	736.20		736.20	3.43			3.43		
	Industrial - SU3/SU10	Drum and small package filling	CS6	PROC9 Transfer of substance/mixture into small containers	588.96		588.96	6.86			6.86		
	Industrial - SU3/SU10	Clean down and Maintenance	CS39	PROC8a Non-dedicated discharging to/from vessels	736.20		736.20	13.71			13.71		
	Industrial - SU3/SU10	Storage	CS67	PROC1 Closed process (no sampling)	0.03		0.03	0.34			0.34		
	Industrial - SU3/SU10	Storage	CS67	PROC2 Closed continuous process (with sampling)	147.24		147.24	1.37			1.37		

1.4 Uses in Coatings – Industrial

Table 1: Mapping Uses				Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use									
				Use Descriptor	Inhalatory exposure			Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	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**	Comments
Use in Coatings (Industrial Application)	**Industrial - SU3**	General exposures (closed systems) [CS15].	**[CS15]**	PROC1 - Use in closed process, no likelihood of exposure	0.03		0.03	0.34			0.34		
	Industrial - SU3	General exposures (closed systems) [CS15].	**[CS15] [CS56] [CS38]**	PROC2 - Use in closed, continuous process with occasional controlled	147.24		147.24	1.37			1.37		
	Industrial - SU3	Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing [CS94].	**[CS94]**	PROC2 - Use in closed, continuous process with occasional controlled exposure	6625.00	Vent (0.7)	1987.50	1.37			1.37		15% of LEL has been applied for Tier 1 predicted exposure estimate due to elevated temperature
	Industrial - SU3	Mixing operations (closed systems) [CS29].	**[CS29] [CS15]**	PROC3 - Use in closed batch process (synthesis or formulation)	294.48		294.48	0.34			0.34		
	Industrial - SU3	Film formation - air drying [CS95].	**[CS95]**	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	294.48		294.48	6.86			6.86		
	Industrial - SU3	Preparation of material for application [CS96].	**[CS96] [CS30]**	PROC5 - Mixing or blending in batch processes (multistage and/or significant contact)	736.20		736.20	13.71			13.71		
	Industrial - SU3	Spraying (automatic/robotic) [CS97].	**[CS97]**	PROC7 - Industrial spraying	1472.39		1472.39	42.86			42.86		
	Industrial - SU3	Manual [CS34].	**[CS34] [CS10]**	PROC7 - Industrial spraying	1472.39		1472.39	42.86			42.86		
Duration Option	**Industrial - SU3**	Material transfers [CS3].	**[CS3]**	PROC8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities	736.20		736.20	13.71			13.71		
	Industrial - SU3	Material transfers [CS3].	**[CS3]**	PROC8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities	441.72		441.72	6.86			6.86		
	Industrial - SU3	Roller, spreader, flow application [CS98].	**[CS98]**	PROC10 - Roller application or brushing	736.20		736.20	27.43			27.43		
	Industrial - SU3	Dipping, immersion and pouring [CS4].	**[CS4]**	PROC13 - Treatment of articles by dipping and pouring	736.20		736.20	13.71			13.71		
	Industrial - SU3	Laboratory activities [CS36].	**[CS36]**	PROC15 - Use of laboratory reagents in small scale laboratories	147.24		147.24	0.34			0.34		
	Industrial - SU3	Material transfers [CS3].	**[CS3] [CS8] [CS22]**	PROC9 - Transfer of chemicals into small containers (dedicated filling line)	588.96		588.96	6.86			6.86		
	Industrial - SU3	Production or preparation or articles by tabletting, compression, extrusion or pelletisation [CS100].	**[CS100]**	PROC14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation	736.20		736.20	3.43			3.43		

1.5 Use in Cleaning Agents – Industrial

	Table 1: Mapping Uses in the Supply Chain				Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use								
				Use Descriptor	Inhalatory exposure			Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	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**	Comments
Uses in Cleaning	Industrial - SU3	Bulk transfers [CS14].	[CS14]	PROC8a -Transfer of chemicals from/to vessels/ large containers at non dedicated facilities	736.20		736.20	13.71			13.71		
	Industrial - SU3	Automated process with (semi) closed systems. [CS93].	[CS93]	PROC2 - Use in closed, continuous process with occasional controlled exposure	147.24		147.24	1.37			1.37		
	Industrial - SU3	Automated process with (semi) closed systems. [CS93].	[CS93]	PROC3 - Use in closed batch process (synthesis or formulation)	294.48		294.48	0.34			0.34		
	Industrial - SU3	Application of cleaning products in closed systems [CS101].	[CS101]	PROC2 - Use in closed, continuous process with occasional controlled exposure	147.24		147.24	1.37			1.37		
	Industrial - SU3	Filling / preparation of equipment from drums or containers. [CS45].	[CS45]	PROC8b -Transfer of chemicals from/to vessels/ large containers at dedicated facilities	441.72		441.72	6.86			6.86		
	Industrial - SU3	Use in contained batch processes [CS37].	[CS37]	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	294.48		294.48	6.86			6.86		
	Industrial - SU3	Degreasing small objects in cleaning station [CS41].	[CS41]	PROC13 - Treatment of articles by dipping and pouring	736.20		736.20	13.71			13.71		
	Industrial - SU3	Cleaning with low-pressure washers [CS42].	[CS42]	PROC10 - Roller application or brushing	736.20		736.20	27.43			27.43		
	Industrial - SU3	Cleaning with high pressure washers [CS44].	[CS44]	PROC7 -Industrial spraying	1472.39		1472.39	42.86			42.86		
	Industrial - SU3	Manual [CS34].	[CS34]	PROC10 - Roller application or brushing	736.20		736.20	27.43			27.43		

1.6 Use in Cleaning Agents – Professional

	Table 1: Mapping Uses in the Supply Chain				Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use								
				Use Descriptor	Inhalatory exposure			Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	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**	Comments
The professional use as a component of cleaning products.	Professional - SU22	Filling / preparation of equipment from drums or containers. [CS45].	[CS45]	PROC8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities	736.20		736.20	6.86			6.86		
	Professional - SU22	Automated process with (semi) closed systems. [CS93].	[CS93]	PROC2 - Use in closed, continuous process with occasional controlled exposure	147.24		147.24	1.37			1.37		
	Professional - SU22	Automated process with (semi) closed systems. [CS93].	[CS93]	PROC3 - Use in closed batch process (synthesis or formulation)	294.48		294.48	0.34			0.34		
	Professional - SU22	Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products) [CS76].	[CS76]	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	736.20		736.20	6.86			6.86		
	Professional - SU22	Filling / preparation of equipment from drums or containers. [CS45].	[CS45]	PROC8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities.	1472.39		1472.39	13.71			13.71		
	Professional - SU22	Manual [CS34].	[CS34]	PROC13 - Treatment of articles by dipping and pouring	736.20		736.20	13.71			13.71		
	Professional - SU22	Cleaning with low-pressure washers [CS42].	[CS42]	PROC10 - Roller application or brushing	1472.39		1472.39	27.43			27.43		
	Professional - SU22	Cleaning with high pressure washers [CS44].	[CS44]	PROC11- Non industrial spraying	2944.79	Duration (0.4)	1766.87	107.14			107.14		
	Professional - SU22	Cleaning with high pressure washers [CS44].	[CS44]	PROC11- Non industrial spraying	2944.79	Duration (0.4)	1766.87	107.14			107.14		
	Professional - SU22	Manual [CS34].	[CS34]	PROC10 - Roller application or brushing	1472.39		1472.39	27.43			27.43		
	Professional - SU22	Ad hoc manual application via trigger sprays, dipping, etc. [CS27].	[CS27]	PROC10 - Roller application or brushing	1472.39		1472.39	27.43			27.43		
	Professional - SU22	Ad hoc manual application via trigger sprays, dipping, etc. [CS27].	[CS27]	PROC10 - Roller application or brushing	1472.39		1472.39	27.43			27.43		
	Professional - SU22	Application of cleaning products in closed systems [CS101].	[CS101]	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	736.20		736.20	6.86			6.86		
	Professional - SU22	Cleaning of medical devices [CS74].	[CS74]	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	736.20		736.20	6.86			6.86		

1.7 Use as a Blowing Agent – Industrial

Table 1: Mapping Uses in the Supply								Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use								
					Typical Mapped RMMs		Use Descriptor	Inhalatory exposure			Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	Typical Mapped 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**	Comments
Blowing agents	Industrial - SU 3	Delivery of solvent to plant storage	CS14	Closed system, ambient temp. Filling point outdoors. Exposure potential limited to coupling/uncoupling activities (<15 min/d)	Dedicated line couplings. Operator in attendance.	NO LEV	PROC8b	441.72		441.72	6.86			6.86		
	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	0.03		0.03	0.34			0.34		
	Industrial - SU 3	Foam production through polymer extrusion	CS122	Indoor, ambient temp.	Extrusion area under LEV (slot design)	With LEV	PROC12	294.48		294.48	0.34			0.34		
	Industrial - SU 3	Foam panel finishing (shaving/cutting)	CS134	Enclosed area (no operator) under LEV	Enclosure area under LEV	With LEV	PROC12	294.48		294.48	0.34			0.34		
	Industrial - SU 3	Foam panel shavings recycling	CS123	Indoor, ambient temp.	Enclosure area under LEV	With LEV	PROC12	294.48		294.48	0.34			0.34		
	Industrial - SU 3	Foam panel packing	CS124	Indoor, ambient temp.	General ventilation	NO LEV	PROC12	294.48		294.48	0.34			0.34		
	Industrial - SU 3	Foam panel curing	CS67	Indoor, ambient temp. Warehouse operations with forklift truck. No direct contact with product	General ventilation	NO LEV	PROC12	294.48		294.48	0.34			0.34		
	Industrial - SU 3	Mixing with polystyrene beads in reactor	CS29	Closed system, Operating Temp. 120-130 dC (**elevated temperature**); 4.5% agent in mix	Closed system; remotely controlled / automatic operation; forced area ventilation; air monitoring to detect leakages	With LEV	PROC3	6625.00	Vent (0.7)	1987.50	0.34			0.34		15% of LEL has been applied for Tier 1 predicted exposure estimate due to elevated temperature
	Industrial - SU 3	Transfer to and holding in waiting tank	CS66	Closed system, **elevated temperature**; 4.5% agent in mix	Closed system; remotely controlled / automatic operation; forced area ventilation; air monitoring to detect leakages	NO LEV	PROC3	6625.00	Vent (0.7)	1987.50	0.34			0.34		15% of LEL has been applied for Tier 1 predicted exposure estimate due to elevated temperature
	Industrial - SU 3	Centrifuging of slurry of beads and process water	CS127	Closed system, **elevated temperature**; 4.5% agent in mix	Closed system; remotely controlled / automatic operation; forced area ventilation; air monitoring to detect leakages	NO LEV	PROC3	6625.00	Vent (0.7)	1987.50	0.34			0.34		15% of LEL has been applied for Tier 1 predicted exposure estimate due to elevated temperature
	Industrial - SU 3	Drying of polystyrene powder/granules	CS12	Indoor, ambient temp. Dedicated equipment.	Vented silo	NO LEV	PROC12	294.48		294.48	0.34			0.34		
	Industrial - SU 3	Loading/packaging for transport to customers	CS128	Indoor, ambient temp. Dedicated equipment.	Forced ventilation	NO LEV	PROC8b	441.72		441.72	6.86			6.86		
	Industrial - SU 3	Steam-heating and expansion of expandable polystyrene granulate	CS129	4% blowing agent in granulate; **Elevated temperature**	Ventilation, waste air treatment	NO LEV	PROC12	6625.00	Vent (0.7)	1987.50	0.34			0.34		15% of LEL has been applied for Tier 1 predicted exposure estimate due to elevated temperature
	Industrial - SU 3	Storage and ageing of partially expanded polystyrene granulate	CS129	Open silo's; 3% blowing agent in granulate	Vented silo	NO LEV	PROC12	294.48		294.48	0.34			0.34		
	Industrial - SU 3	Moulding and block forming with expanded polystyrene granulate	CS130	Use of steam in partially closed moulds; **elevated temperature**; 2% blowing agent in granulate	Local exhaust ventilation (80%)	With LEV	PROC12	6625.00	Vent (0.7)	1987.50	0.34			0.34		15% of LEL has been applied for Tier 1 predicted exposure estimate due to elevated temperature
	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	294.48		294.48	0.34			0.34		
	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	294.48		294.48	0.34			0.34		
	Industrial - SU 3	Drum filling blended mix	CS6, CS45	Indoor, ambient temp.	Filling station under LEV; remotely operated	With LEV	PROC9	588.96		588.96	6.86			6.86		
	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	294.48		294.48	0.34			0.34		
	Industrial - SU 3	Foam compression to expel residual blowing agent	CS133	Indoor, ambient temp. Automated machinery.	LEV/enclosure	With LEV	PROC12	294.48		294.48	0.34			0.34		
	Industrial - SU 3	Foam article automated cutting	CS131	Enclosed area (no operator) under LEV, only traces of blowing agent left	LEV/enclosure	With LEV	PROC12	294.48		294.48	0.34			0.34		

1.8 Use in Agrochemicals – Professional

	Table 1: Mapping Uses in the Supply Chain			Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use									
				Use Descriptor	Inhalatory exposure			Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	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**	Comments
Use in Agrochemicals	Professional - SU22	transfer from/pouring from containers	CS22	PROC8b Discharging to/from vessels	736.20		736.20	6.86	n/a		6.86	n/a	
10 and 50 checked and GESs revised	Professional - SU22	mixing in containers	CS23	PROC4 Closed batch process (with sampling)	736.20		736.20	6.86	n/a		6.86	n/a	
	Professional - SU22	spraying and fogging by manual application.	CS24	PROC11 - Non industrial spraying	2944.79	Duration (0.4)	1766.87	107.14	n/a		107.14	n/a	
	Professional - SU22	spraying and fogging by machine application	CS25	PROC11 - Non industrial spraying	2944.79	Duration (0.4)	1766.87	107.14	n/a		107.14	n/a	
	Professional - SU22	small ad hoc application via dipping, trigger sprays, etc	CS27	PROC13 - Treatment of articles by dipping and pouring	736.20		736.20	13.71	n/a		13.71	n/a	
	Professional - SU22	cleandown and maintenance of equipment	CS26	PROC8a Discharging to/from vessels	1472.39		1472.39	13.71	n/a		13.71	n/a	
	Professional - SU22	disposal of wastes	CS28	PROC8a Discharging to/from vessels	1472.39		1472.39	13.71	n/a		13.71	n/a	
	Professional - SU22	Storage	CS67	PROC1	0.29		0.29	0.34	n/a		0.34	n/a	
	Professional - SU22	Storage	CS67	PROC2 Closed continuous process (sometimes with sampling)	147.24		147.24	1.37	n/a		1.37	n/a	

1.9 Use as a Fuel – Industrial

Table 1: Mapping Uses			Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use										
			Use Descriptor	Inhalatory exposure			Dermal exposure						
	User Group	Contributing Scenarios	CS Ref	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**	Comments
Use as a fuel	Industrial - SU3	Bulk transfers (barge, rail and road)	CS14	PROC8b Dedicated Discharging to/from vessels	441.72		441.72	6.86	n/a		6.86	n/a	
	Industrial - SU3	Transfers from drums and containers	CS8	PROC8b Dedicated Discharging to/from vessels	441.72		441.72	6.86	n/a		6.86	n/a	
	Industrial - SU3	General use exposures as a fuel	CS15	PROC1 Use as a fuel	0.03		0.03	0.34	n/a		0.34	n/a	
	Industrial - SU3	General use exposures as a fuel	CS15	PROC2 Use as a fuel	147.24		147.24	1.37	n/a		1.37	n/a	
	Industrial - SU3	Use a fuel	CS15 CS107	PROC16 - use as a fuel	73.62		73.62	0.34	n/a		0.34	n/a	
	Industrial - SU3	Use a fuel additive diluent	CS15 CS107	PROC3 Closed batch process (with sampling)	294.48		294.48	0.34	n/a		0.34	n/a	
	Industrial - SU3	Vehicle/boiler maintenance	CS39 (changed from CS5)	PROC8a Non-dedicated Discharging to/from vessels	736.20		736.20	13.71	n/a		13.71	n/a	
	Industrial - SU3	Cleaning fuel storage tanks	CS103	PROC8a Discharging to/from vessels	736.20		736.20	13.71	n/a		13.71	n/a	
	Industrial - SU3	Storage	CS67	PROC1 Closed continuous process (sometimes with sampling)	0.03		0.03	0.34	n/a		0.34	n/a	
	Industrial - SU3	Storage	CS67	PROC2 Closed continuous process (sometimes with sampling)	147.24		147.24	1.37	n/a		1.37	n/a	

1.10 Use as a Fuel – Professional

	Table 1: Mapping Uses			Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use									
				Use Descriptor	Inhalatory exposure			Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	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**	Comments
Use as a fuel	Professional - SU22	Bulk transfers (e.g. heating oil and diesel deliveries)	CS14	PROC8b Dedicated Discharging to/from vessels	736.20		736.20	6.86	n/a		6.86	n/a	
	Professional - SU22	Transfers from drums and containers	CS8	PROC8b Dedicated Discharging to/from vessels	736.20		736.20	6.86	n/a		6.86	n/a	
	Professional - SU22	Refuelling vehicles, light aircraft or marine	CS-I Refuelling - Concawe	PROC8b Dedicated Discharging to/from vessels	736.20		736.20	6.86	n/a		6.86	n/a	
	Professional - SU22	General use exposures as a fuel	CS15	PROC1 Use as a fuel	0.29		0.29	0.34	n/a		0.34	n/a	
	Professional - SU22	General use exposures as a fuel	CS15	PROC2 Use as a fuel	147.24		147.24	1.37	n/a		1.37	n/a	
	Professional - SU22	Use a fuel additive diluent	~~GES16,~~ CS15 CS107	PROC3 Closed batch process (with sampling)	294.48		294.48	0.34	n/a		0.34	n/a	
	Professional - SU22	Use a fuel	~~GES16,~~ CS15 CS107	PROC16 - use as a fuel	147.24		147.24	0.34	n/a		0.34	n/a	
	Professional - SU22	Equipment maintenance e.g. Vehicle, boiler, pump maintenance, pump calibration	CS39	PROC8a Discharging to/from vessels	1472.39		1472.39	13.71	n/a		13.71	n/a	
	Professional - SU22	Vessel / container cleaning	CS103	PROC8a Discharging to/from vessels	1472.39		1472.39	13.71	n/a		13.71	n/a	
	Professional - SU22	Storage	CS67	PROC1 Closed continuous process (sometimes with sampling)	0.29		0.29	0.34	n/a		0.34	n/a	

1.11 Use as Functional Fluids – Industrial

	Table 1: Mapping Uses			Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use										
				Use Descriptor	Inhalatory exposure			Dermal exposure						
	User Group	Contributing Scenarios	CS Ref	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**	Comments
Functional fluids	Industrial - SU10	Bulk transfers to/from storage	CS14, CS107	PROC1 Closed continuous process (sometimes with sampling)	0.03		0.03	0.34	n/a		0.34	n/a	
	Industrial - SU10	Bulk transfers to/from storage	CS14, CS107	PROC2	147.24		147.24	1.37	n/a		1.37	n/a	
10 and 50 checked and GESs revised	Industrial - SU10	Transfers from drums to filling machinery	CS8	PROC8b Discharging to/from vessels	441.72		441.72	6.86	n/a		6.86	n/a	
	Industrial - SU10	filling articles from predominantly enclosed machines	CS53 delete, CS84, CS107	PROC9 Transfer of chemicals into small containers	588.96		588.96	6.86	n/a		6.86	n/a	
	Industrial - SU10	manual filling of machines	CS45	PROC8a Discharging to/from vessels (non-dedicated)	736.20		736.20	13.71	n/a		13.71	n/a	
	Industrial - SU10	operation of closed equipment containing functional fluids	CS15	PROC2	147.24		147.24	1.37	n/a		1.37	n/a	
	Industrial - SU10	operation of open equipment containing functional fluids at elevated temperatures	CS16	PROC4 Use in batch and other process	6625.00	Vent (0.7)	1987.50	6.86	n/a		6.86	n/a	15% of LEL has been applied for Tier 1 predicted exposure estimate due to elevated temperature
	Industrial - SU10	Re-work on off specification articles	CS19	PROC9 Transfer of chemicals into small containers	588.96		588.96	6.86	n/a		6.86	n/a	
	Industrial - SU10	maintenance of equipment	CS5	PROC8a Discharging to/from vessels (non-dedicated)	736.20		736.20	13.71	n/a		13.71	n/a	
	Industrial - SU3	Storage	CS67	PROC1 Closed continuous process (sometimes with sampling)	0.03		0.03	0.34	n/a		0.34	n/a	
	Industrial - SU3	Storage	CS67	PROC2 Closed continuous process (sometimes with sampling)	147.24		147.24	1.37	n/a		1.37	n/a	

1.12 Use as Functional Fluids – Professional

Table 1: Mapping Uses in the Supply				Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use									
				Use Descriptor	Inhalatory exposure			Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	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**	Comments
Functional fluids	Professional - SU22	Transfers from drums to filling machinery	CS8	PROC8a Discharging to/from vessels (non-dedicated)	1472.39		1472.39	13.71	n/a		13.71	n/a	
	Professional - SU22	filling from small containers e.g. cans	CS22	PROC9 Transfer of chemicals into small containers	736.20		736.20	6.86	n/a		6.86	n/a	
	Professional - SU22	manual filling from drums	CS45	PROC9 Transfer of chemicals into small containers	736.20		736.20	6.86	n/a		6.86	n/a	
	Professional - SU22	operation of equipment containing functional fluids	CS15	PROC1	0.29		0.29	0.34	n/a		0.34	n/a	
	Professional - SU22	operation of equipment containing functional fluids	CS15	PROC2 Closed continuous process (sometimes with sampling)	147.24		147.24	1.37	n/a		1.37	n/a	
	Professional - SU22	operation of equipment containing functional fluids	CS15	PROC3	294.48		294.48	0.34	n/a		0.34	n/a	
	Professional - SU22	operation of equipment containing functional fluids	CS16	PROC20 Heat and pressure transfer fluids (closed systems)	147.24		147.24	1.71	n/a		1.71	n/a	
	Professional - SU22	operation of equipment containing functional fluids at elevated temperatures	CS16	PROC20 Heat and pressure transfer fluids (closed systems)	6625.00	Vent (0.7)	1987.50	1.71	n/a		6.86	n/a	15% of the LEL has been applied as the Tier 1 estimate due to elevated temperature
	Professional - SU22	Re-work on off specification articles	CS19	PROC9 - Transfer of chemicals into small containers	736.20		736.20	6.86	n/a		6.86	n/a	
	Professional - SU22	maintenance of equipment	CS5	PROC8a Discharging to/from vessels (non-dedicated)	1472.39		1472.39	13.71	n/a		13.71	n/a	
	Professional - SU22	Storage	CS67	PROC1 Closed continuous process (sometimes with sampling)	0.29		0.29	0.34	n/a		0.34	n/a	
	Professional - SU22	Storage	CS67	PROC2 Closed continuous process (sometimes with sampling)	147.24		147.24	1.37	n/a		1.37	n/a	

1.13 Use 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								
				Use Descriptor	Inhalatory exposure			Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	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**	Comments
Use in laboratories	Industrial - SU3, 9, etc	CS36 Laboratory activities	CS36	PROC15	147.24		147.24	0.34	n/a		0.34	n/a	
	Industrial - SU3, 9, etc	CS47 Cleaning [wiping, brushing, flushing]	CS47	PROC10	736.20		736.20	27.43	n/a		27.43	n/a	

1.14 Use in Laboratory Applications – Professional

	Table 1: Mapping Uses in the Supply Chain				Table 2: Characterising the Risk - High VP Liquids - Chemical Safety Assessment - Evaluation of Safe Use								
				Use Descriptor	Inhalatory exposure			Dermal exposure					
	User Group	Contributing Scenarios	CS Ref	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**	Comments
Use in laboratories	**Professional - SU22**	CS36 Laboratory activities	CS36	PROC15	147.24		147.24	0.34	n/a		0.34	n/a	
	Professional - SU22	CS47 Cleaning [wiping, brushing, flushing]	CS47	PROC10	1472.39	LEV (0.8) Vent (0.7)	88.34	27.43	n/a	LEV (0.95)	1.3715	n/a	

Appendix 2B
Exposure Estimations – consumer

1.1 Uses in Coatings – Consumer

Table 1: Mapping																					
Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels															TRA+ Predicted Exposure - including RMM when needed (substance specific)		
Short Title	Area of Application / UD			Indicator for Basis of Exposure Estimate	Concentration (weight fraction)	EFC1	amount of use (g)	EFC2	Glove Factor	EFC3	Amount swallowed (g)	EFC4	location	Air exchange rate	EFC5	Room Volume (m3)	EFC6	Predicted Dermal Exposure (mg/kg/d)	Predicted Oral Exposure (mg/kg/d)	Predicted Inhalation Exposure (mg/m3)
Coating	Consumer-SU21	PC1:Adhesives, sealants	Glues, hobby use	Based upon daily use														0.00476		8.52
Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.	Consumer-SU21	PC1:Adhesives, sealants	Glues DIY-use (carpet glue, tile glue, wood parquet glue)	Based upon infrequent use (<365 days/yr)														0.00006		17.48
PC1, PC4, PC8, PC9, PC15, PC18, PC23, PC24, PC31,PC34, (PC5, PC10)	Consumer-SU22	PC1:Adhesives, sealants	Glue from spray	Based upon daily use														0.00476		80.56
	Consumer-SU24	PC1:Adhesives, sealants	Sealants	Based upon daily use														0.00119		35.25
	Consumer-SU03	PC4_n:Anti-freeze and de-icing products	Washing car window	Based upon daily use																0.00
	Consumer-SU21	PC4_n:Anti-freeze and de-icing products	Pouring into radiator	Based upon daily use														0.00238		1.81
		PC4_n:Anti-freeze and de-icing products	Lock de-icer	Based upon daily use														0.00179		0.51
	Consumer-SU24	PC8_n: Biocidal products (excipient use only for solvent products)	Laundry and dish washing products	Based upon daily use														0.00014		0.67
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Based upon daily use														0.00943		0.84
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Based upon daily use														0.00238		1.73
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Waterborne latex wall paint	Based upon daily use														0.03144		105.35
	Consumer-SU24	PC9a:Coatings and paints, fillers putties, thinners	Solvent rich, high solid, water borne paint	Based upon daily use														0.03144		520.64
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Aerosol spray can	Based upon daily use																34.29
	Consumer-SU24	PC9a:Coatings and paints, fillers putties, thinners	Removers (paint-, glue-, wall paper-, sealant-remover)	Based upon daily use														0.05717		595.68
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Fillers and putty	Based upon daily use														0.00476		5.37
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Plasters and floor equalizers	Based upon infrequent use (<365 days/yr)														0.00188		22.02
	Consumer-SU03	PC9b:Fillers, putties, plasters, modeling clay	Modelling clay	Based upon daily use															1.00	
	Consumer-SU21	PC9c:Finger paints	Finger paints	Based upon daily use															67.50	
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Waterborne latex wall paint	Based upon daily use														0.03144		105.35
	Consumer-SU24	PC15_n: Non-metal surface treatment products	Solvent rich, high solid, water borne paint	Based upon daily use														0.03144		520.64
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Aerosol spray can	Based upon daily use																34.29
	Consumer-SU24	PC15_n: Non-metal surface treatment products	Removers (paint-, glue-, wall paper-, sealant-remover)	Based upon daily use														0.05717		595.68
	Consumer-SU21	PC18_n: Ink and toners	Inks and toners.	Based upon daily use														0.00524		10.18
	Consumer-SU21	PC23_n: Leather tanning, dye, finishing, impregnation and care products	Polishes, wax / cream (floor, furniture, shoes)	Based upon daily use														0.01768		50.84
	Consumer-SU21	PC23_n: Leather tanning, dye, finishing, impregnation and care products	Polishes, spray (furniture, shoes)	Based upon daily use														0.00478		17.62
	Consumer-SU03	PC24: Lubricants, greases, and release products	Liquids	Based upon daily use														0.00260		3.98
	Consumer-SU21	PC24: Lubricants, greases, and release products	Pastes	Based upon daily use																
	Consumer-SU03	PC24: Lubricants, greases, and release products	Sprays	Based upon daily use														0.00238		12.06
	Consumer-SU21	PC31:Polishes and wax blends	Polishes, wax / cream (floor, furniture, shoes)	Based upon daily use														0.01768		128.91
	Consumer-SU22	PC31:Polishes and wax blends	Polishes, spray (furniture, shoes)	Based upon daily use														0.00478		11.01
	Consumer-SU21	PC34_n: Textile dyes, finishing and impregnating products		Based upon daily use														0.00029		18.02

1.2 Uses in Cleaning – Consumer

Table 1: Mapping Consumer Uses in the Supply Chain

Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels														TRA+ Predicted Exposure - including RMM when (substance specific)		
Short Title	Area of Application / UD			Indicator for Basis of Exposure Estimate	Concentration (weight fraction)	EFC1	amount of use (g)	EFC2	Glove Factor	EFC3	Amount swallowed (g)	EFC4	location	Air exchange rate	EFC5	Room Volume (m3)	EFC6	Predicted Dermal Exposure (mg/kg/d)	Predicted Oral Exposure (mg/kg/d)	Predicted Inhal Exposure (mg/
																		d	o	l
Cleaning	Consumer\-SU21	PC3:Air care products	Air care, instant action (aerosol sprays)	Based upon daily use																0.096731
Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products.	Consumer\-SU21	PC3:Air care products	Air care, instant action (aerosol sprays)-pesticidal-excipient only	Based upon daily use																4.836529
PC3, PC4, PC8 (excipient only), PC9, PC24, PC35, PC38	Consumer\-SU21	PC3:Air care products	Air care, continuous action (solid and liquid)	Based upon daily use														0.000010		0.1653
	Consumer\-SU21	PC3:Air care products	Air care, continuous action (solid and liquid)-pesticidal-excipient only	Based upon daily use														0.000001		0.8265
	Consumer\-SU21	PC4_n:Anti-freeze and de-icing products	Washing car window	Based upon daily use																0.0001
	Consumer\-SU21	PC4_n:Anti-freeze and de-icing products	Pouring into radiator	Based upon daily use														0.00238		1.8072
		PC4_n:Anti-freeze and de-icing products	Lock de-icer	Based upon daily use														0.00179		0.5110
	Consumer\-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Laundry and dish washing products	Based upon daily use														0.00014		0.6750
	Consumer\-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Based upon daily use														0.00943		0.8420
	Consumer\-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Based upon daily use														0.002378		1.7347
	Consumer\-SU21	PC9a:Coatings and paints, fillers putties, thinners	Waterborne latex wall paint	Based upon daily use														0.031		105.349
	Consumer\-SU21	PC9a:Coatings and paints, fillers putties, thinners	Solvent rich, high solid, water borne paint	Based upon daily use														0.031		520.639
	Consumer\-SU21	PC9a:Coatings and paints, fillers putties, thinners	Aerosol spray can	Based upon daily use																34.290
	Consumer\-SU21	PC9a:Coatings and paints, fillers putties, thinners	Removers (paint-, glue-, wall paper-, sealant-remover)	Based upon daily use														0.0572		595.6834
	Consumer\-SU21	PC9b:Fillers, putties, plasters, modeling clay	Fillers and putty	Based upon daily use														0.0048		5.3673
	Consumer\-SU21	PC9b:Fillers, putties, plasters, modeling clay	Plasters and floor equalizers	Based upon infrequent use (<365 days/yr)														0.0019		22.0172
	Consumer\-SU21	PC9b:Fillers, putties, plasters, modeling clay	Modelling clay	Based upon daily use														2.544	1	
	Consumer\-SU21	PC9c:Finger paints	Finger paints	Based upon daily use														127.2	67.5	
	Consumer\-SU21	PC24: Lubricants, greases, and release products	Liquids	Based upon daily use														0.0026		3.9758
	Consumer\-SU21	PC24: Lubricants, greases, and release products	Pastes	Based upon daily use																
	Consumer\-SU21	PC24: Lubricants, greases, and release products	Sprays	Based upon daily use														0.00238		12.06054
	Consumer\-SU21	PC35:Washing and cleaning products (including solvent based products)	Laundry and dish washing products	Based upon daily use														0.00014		0.67495
	Consumer\-SU21	PC35:Washing and cleaning products (including solvent based products)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Based upon daily use														0.00943		0.84202
	Consumer\-SU21	PC35:Washing and cleaning products (including solvent based products)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Based upon daily use														0.00238		1.73473
	Consumer\-SU21	PC38_n: Welding and soldering products, flux products	NOTE, n_assessment not in TRA	Based upon daily use																3.75990

1.3 Use as a Fuel – Consumer

Table 1: Mapping Consumer Uses in the Supply Chain																					
Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels																TRA + Predicted Exposure - including RMM when needed (substance specific)		
Short Title	Area of Application / UD			Indicator for Basis of Exposure Estimate	Concentration (weight fraction)	EFC1	amount of use (g)	EFC2	Glove Factor	EFC3	Amount swallowed (g)	EFC4	location	Air exchange rate	EFC5	Room Volume (m3)	EFC6	Predicted Dermal Exposure (mg/kg/d)	Predicted Oral Exposure (mg/kg/d)	Predicted Inhalation Exposure (mg/m3)
Fuels	Consumer SU21	PC13:Fuels	Liquid - subcategories added: Automotive Refuelling	Based upon daily use														0.00035		1.53930
PC13	Consumer SU21	PC13:Fuels	Liquid - subcategories added: Scooter Refuelling	Based upon daily use														0.000231		1.02111
	Consumer SU21	PC13:Fuels	Liquid - subcategories added: Garden Equipment - Use	Based upon daily use																7.27923
	Consumer SU21	PC13:Fuels	Liquid (subcategories added): Garden Equipment - Refueling	Based upon daily use														0.00042		0.80887
	Consumer SU21	PC13:Fuels	Liquid (subcategories added): Home space heater fuel	Based upon daily use														0.00021		0.23228
	Consumer SU21	PC13:Fuels	Liquid - subcategories added: Lamp oil	Based upon daily use														0.000091		0.13489

1.4 Other Uses – Consumer

Table not applicable

Appendix 3a

Risk characterisation – worker

1.1 Manufacture of Substance - Industrial

Table 1: Mapping Uses in the Supply	User Group	Contributing Scenarios	CS Ref	Use Descriptor / Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Manufacture of substance	**Industrial - SU8/9/3**	General process exposures (no sampling)	**CS15**	PROC1 Closed process (no sampling)	0.000	0.001	0.001
	Industrial - SU8/9/3	General process exposures and sample collection	**CS15**	PROC2 Closed continuous process (with sampling)	0.049	0.003	0.052
	Industrial - SU8/9/3	General process exposures	**CS15**	PROC3 Closed batch process (with sampling)	0.098	0.001	0.099
	Industrial - SU8/9/3	General exposures open batch process	**CS16**	PROC4 batch process with exposure	0.098	0.016	0.114
	Industrial - SU8/9/3	Sample collection	**CS2**	PROC8b Dedicated discharging to/from vessels	0.147	0.016	0.163
	Industrial - SU8/9/3	Laboratory activities	**CS36**	PROC15 Use in laboratory	0.049	0.001	0.050
	Industrial - SU8/9/3	Bulk transfers (no lev)	**CS14, CS108**	PROC8b Dedicated discharging to/from vessels	0.147	0.016	0.163
	Industrial - SU8/9/3	Bulk transfers (with lev)	**CS14, CS107**	PROC8b Dedicated discharging to/from vessels	0.147	0.016	0.163
	Industrial - SU8/9/3	Clean down and Maintenance	**CS39**	PROC8a Non-dedicated discharging to/from vessels	0.245	0.032	0.277
	Industrial - SU3 / SU10	Storage	**CS67**	PROC1 Closed process (no sampling)	0.000	0.001	0.001
	Industrial - SU3 / SU10	Storage	**CS67**	PROC2 Closed continuous process (with sampling)	0.049	0.003	0.052

1.2 Distribution of Substance – Industrial

Table 1: Mapping Uses in the Supply	User Group	Contributing Scenarios	CS Ref	Use Descriptor / 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 equipment, in-line filter cleaning)	**CS15**	PROC1 Closed process (no sampling)	0.000	0.001	0.001
	Industrial - SU3	General process exposures (occasional controlled exposure)	**CS15**	PROC2 Closed continuous process (with sampling)	0.049	0.003	0.052
	Industrial - SU3	General process exposures - closed batch process	**CS15**	PROC3 Closed batch process (with sampling)	0.098	0.001	0.099
	Industrial - SU3	General exposures open batch process	**CS16**	PROC4 batch process with exposure	0.098	0.016	0.114
	Industrial - SU3	Sample collection	**CS2**	PROC3 Closed batch process (with sampling)	0.098	0.001	0.099
	Industrial - SU3	Laboratory activities	**CS36**	PROC15 Use in laboratory	0.049	0.001	0.050
Combine in narrative as Bulk Transfer CS14 unless differentiation required in practice	**Industrial - SU3**	Bulk closed loading and unloading NEW CS (e.g. road/rail car bottom loading/unloading; marine vessel/barge loading/unloading;)	**CS14, CS107 Bulk transfers (closed systems)**	PROC8b Dedicated Discharging to/from vessels	0.147	0.016	0.163
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)**	PROC8b Dedicated discharging to/from vessels	0.147	0.016	0.163
	Industrial - SU3	Drum and small package filling	**CS6**	PROC9 Transfer of substance/mixture into small containers	0.196	0.016	0.212
	Industrial - SU3	Clean down and Maintenance	**CS39**	PROC8a Non-dedicated discharging to/from vessels	0.245	0.032	0.277
	Industrial - SU3	Storage	**CS67**	PROC1 Closed continuous process (sometimes with sampling)	0.000	0.001	0.001
	Industrial - SU3	Storage	**CS67**	PROC2 Closed continuous process (sometimes with sampling)	0.049	0.003	0.052

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

Table 1: Mapping Uses in the Supply	User Group	Contributing Scenarios	CS Ref	Use Descriptor / 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/ SU3/SU10	General process exposures (no sampling) (e.g. In-line additive dosing equipment, in-line filter cleaning)	CS15	PROC1 Closed process (no sampling)	0.000	0.001	0.001
	Industrial - SU3/ SU10	General process exposures and sample collection	CS15	PROC2 Closed continuous process (with sampling)	0.049	0.003	0.052
	Industrial - SU3/ SU10	General process exposures (e.g. In-line additive dosing equipment, in-line filter cleaning)	CS15	PROC3 Closed batch process (with sampling)	0.098	0.001	0.099
	Industrial - SU3/ SU10	General exposures open batch process	CS16	PROC4 batch process with exposure	0.098	0.016	0.114
Elevated temperature therefore applied value for medium volatility	Industrial - SU3/ SU10	Batch processes at elevated temperatures (e.g. solvents resin manufacture, grease manufacture)	CS136	PROC3 Closed batch process (with sampling)	0.663	0.001	0.663
	Industrial - SU3/ SU10	Sample collection	CS2	PROC3 Closed batch process (with sampling)	0.098	0.001	0.099
	Industrial - SU3/ SU3	Laboratory activities	CS36	PROC15 Use in laboratory	0.049	0.001	0.050
	Industrial - SU3/ SU10	Bulk transfers	CS14	PROC8b Dedicated discharging to/from vessels	0.147	0.016	0.163
	Industrial - SU3/ SU10	Mixing operations (open systems)	CS30	PROC5 Mixing or blending	0.245	0.032	0.277
	Industrial - SU3/ SU10	Transfer from/pouring from containers , Manual	CS34 + CS22	PROC8a Non-dedicated discharging to/from vessels	0.245	0.032	0.277
	Industrial - SU3/ SU10	Drum/Batch transfers	CS8	PROC8b Dedicated discharging to/from vessels	0.147	0.016	0.163
	Industrial - SU3/ SU10	Tabletting, compression, extrusion or pelletisation	CS100	PROC14 Production of preparation by tabletting, compression, extrusion, pelletisation	0.245	0.008	0.253
	Industrial - SU3/ SU10	Drum and small package filling	CS6	PROC9 Transfer of substance/mixture into small containers	0.196	0.016	0.212
	Industrial - SU3/ SU10	Clean down and Maintenance	CS39	PROC8a Non-dedicated discharging to/from vessels	0.245	0.032	0.277
	Industrial - SU3/ SU10	Storage	CS67	PROC1 Closed process (no sampling)	0.000	0.001	0.001
	Industrial - SU3/ SU10	Storage	CS67	PROC2 Closed continuous process (with sampling)	0.049	0.003	0.052

1.4 Uses in Coatings – Industrial

	Table 1: Mapping Uses						
	User Group	Contributing Scenarios	CS Ref	Use Descriptor / Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Use in Coatings (Industrial Application)	Industrial - SU3	General exposures (closed systems) [CS15].	[CS15]	PROC1 - Use in closed process, no likelihood of exposure	0.000	0.001	0.001
	Industrial - SU3	General exposures (closed systems) [CS15].	[CS15] [CS56] [CS38]	PROC2 - Use in closed, continuous process with occasional controlled	0.049	0.003	0.052
	Industrial - SU3	Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing [CS94].	[CS94]	PROC2 - Use in closed, continuous process with occasional controlled exposure	0.663	0.003	0.666
	Industrial - SU3	Mixing operations (closed systems) [CS29].	[CS29] [CS15]	PROC3 - Use in closed batch process (synthesis or formulation)	0.098	0.001	0.099
	Industrial - SU3	Film formation - air drying [CS95].	[CS95]	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	0.098	0.016	0.114
	Industrial - SU3	Preparation of material for application [CS96].	[CS96] [CS30]	PROC5 -Mixing or blending in batch processes (multistage and/or significant contact)	0.245	0.032	0.277
	Industrial - SU3	Spraying (automatic/robotic) [CS97].	[CS97]	PROC7 -Industrial spraying	0.491	0.099	0.590
	Industrial - SU3	Manual [CS34].	[CS34] [CS10]	PROC7 -Industrial spraying	0.491	0.099	0.590
Duration Option	Industrial - SU3	Material transfers [CS3].	[CS3]	PROC8a -Transfer of chemicals from/to vessels/ large containers at non dedicated facilities	0.245	0.032	0.277
	Industrial - SU3	Material transfers [CS3].	[CS3]	PROC8b -Transfer of chemicals from/to vessels/ large containers at dedicated facilities	0.147	0.016	0.163
	Industrial - SU3	Roller, spreader, flow application [CS98].	[CS98]	PROC10 - Roller application or brushing	0.245	0.063	0.309
	Industrial - SU3	Dipping, immersion and pouring [CS4].	[CS4]	PROC13 - Treatment of articles by dipping and pouring	0.245	0.032	0.277
	Industrial - SU3	Laboratory activities [CS36].	[CS36]	PROC15 - Use of laboratory reagents in small scale laboratories	0.049	0.001	0.050
	Industrial - SU3	Material transfers [CS3].	[CS3] [CS8] [CS22]	PROC9 -Transfer of chemicals into small containers (dedicated filling line)	0.196	0.016	0.212
	Industrial - SU3	Production or preparation or articles by tabletting, compression, extrusion or pelletisation [CS100].	[CS100]	PROC14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation	0.245	0.008	0.253

1.5 Use in Cleaning Agents – Industrial

Table 1: Mapping Uses							
	User Group	Contributing Scenarios	CS Ref	Use Descriptor / Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Use in Coatings (Industrial Application)	Industrial - SU3	General exposures (closed systems) [CS15].	[CS15]	PROC1 - Use in closed process, no likelihood of exposure	0.000	0.001	0.001
	Industrial - SU3	General exposures (closed systems) [CS15].	[CS15] [CS56] [CS38]	PROC2 - Use in closed, continuous process with occasional controlled	0.049	0.003	0.052
	Industrial - SU3	Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing [CS94].	[CS94]	PROC2 - Use in closed, continuous process with occasional controlled exposure	0.663	0.003	0.666
	Industrial - SU3	Mixing operations (closed systems) [CS29].	[CS29] [CS15]	PROC3 - Use in closed batch process (synthesis or formulation)	0.098	0.001	0.099
	Industrial - SU3	Film formation - air drying [CS95].	[CS95]	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	0.098	0.016	0.114
	Industrial - SU3	Preparation of material for application [CS96].	[CS96] [CS30]	PROC5 -Mixing or blending in batch processes (multistage and/or significant contact)	0.245	0.000	0.246
	Industrial - SU3	Spraying (automatic/robotic) [CS97].	[CS97]	PROC7 -Industrial spraying	0.491	0.099	0.590
	Industrial - SU3	Manual [CS34].	[CS34] [CS10]	PROC7 -Industrial spraying	0.491	0.099	0.590
Duration Option	Industrial - SU3	Material transfers [CS3].	[CS3]	PROC8a -Transfer of chemicals from/to vessels/ large containers at non dedicated facilities	0.245	0.032	0.277
	Industrial - SU3	Material transfers [CS3].	[CS3]	PROC8b -Transfer of chemicals from/to vessels/ large containers at dedicated facilities	0.147	0.016	0.163
	Industrial - SU3	Roller, spreader, flow application [CS98].	[CS98]	PROC10 - Roller application or brushing	0.245	0.063	0.309
	Industrial - SU3	Dipping, immersion and pouring [CS4].	[CS4]	PROC13 - Treatment of articles by dipping and pouring	0.245	0.032	0.277
	Industrial - SU3	Laboratory activities [CS36].	[CS36]	PROC15 - Use of laboratory reagents in small scale laboratories	0.049	0.001	0.050
	Industrial - SU3	Material transfers [CS3].	[CS3] [CS8] [CS22]	PROC9 -Transfer of chemicals into small containers (dedicated filling line)	0.196	0.016	0.212
	Industrial - SU3	Production or preparation or articles by tabletting, compression, extrusion or pelletisation [CS100].	[CS100]	PROC14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation	0.245	0.008	0.253

1.6 Use in Cleaning Agents – Professional

	Table 1: Mapping Uses in the Supply Chain						
	User Group	Contributing Scenarios	CS Ref	Use Descriptor Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
The professional use as a component of cleaning products.	Professional - SU22	Filling / preparation of equipment from drums or containers. [CS45].	[CS45]	PROC8b -Transfer of chemicals from/to vessels/ large containers at dedicated facilities	0.245	0.016	0.261
	Professional - SU22	Automated process with (semi) closed systems. [CS93].	[CS93]	PROC2 - Use in closed, continuous process with occasional controlled exposure	0.049	0.003	0.052
	Professional - SU22	Automated process with (semi) closed systems. [CS93].	[CS93]	PROC3 - Use in closed batch process (synthesis or formulation)	0.098	0.001	0.099
	Professional - SU22	Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products) [CS76].	[CS76]	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	0.245	0.016	0.261
	Professional - SU22	Filling / preparation of equipment from drums or containers. [CS45].	[CS45]	PROC8a -Transfer of chemicals from/to vessels/ large containers at non dedicated facilities.	0.491	0.032	0.523
	Professional - SU22	Manual [CS34].	[CS34]	PROC13 - Treatment of articles by dipping and pouring	0.245	0.032	0.277
	Professional - SU22	Cleaning with low-pressure washers [CS42].	[CS42]	PROC10 - Roller application or brushing	0.491	0.063	0.554
	Professional - SU22	Cleaning with high pressure washers [CS44].	[CS44]	PROC11- Non industrial spraying	0.589	0.248	0.837
	Professional - SU22	Cleaning with high pressure washers [CS44].	[CS44]	PROC11- Non industrial spraying	0.589	0.248	0.837
	Professional - SU22	Manual [CS34].	[CS34]	PROC10 - Roller application or brushing	0.491	0.063	0.554
	Professional - SU22	Ad hoc manual application via trigger sprays, dipping, etc. [CS27].	[CS27]	PROC10 - Roller application or brushing	0.491	0.063	0.554
	Professional - SU22	Ad hoc manual application via trigger sprays, dipping, etc. [CS27].	[CS27]	PROC10 - Roller application or brushing	0.491	0.063	0.554
	Professional - SU22	Application of cleaning products in closed systems [CS101].	[CS101]	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	0.245	0.016	0.261
	Professional - SU22	Cleaning of medical devices [CS74].	[CS74]	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	0.245	0.016	0.261

1.7 Use as a Blowing Agent – Industrial

Table 1: Mapping Uses in the Supply	User Group	Contributing Scenarios	CS Ref	Use Descriptor / Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Blowing agents	Industrial - SU 3	Delivery of solvent to plant storage	CS14	PROC8b	0.147	0.016	0.163
	Industrial - SU 3	Injection and mixing into molten polymer mass in extruder	CS29	PROC1	0.000	0.001	0.001
	Industrial - SU 3	Foam production through polymer extrusion	CS122	PROC12	0.098	0.001	0.099
	Industrial - SU 3	Foam panel finishing (shaving/cutting)	CS134	PROC12	0.098	0.001	0.099
	Industrial - SU 3	Foam panel shavings recycling	CS123	PROC12	0.098	0.001	0.099
	Industrial - SU 3	Foam panel packing	CS124	PROC12	0.098	0.001	0.099
	Industrial - SU 3	Foam panel curing	CS67	PROC12	0.098	0.001	0.099
	Industrial - SU 3	Mixing with polystyrene beads in reactor	CS29	PROC3	0.663	0.001	0.663
	Industrial - SU 3	Transfer to and holding in waiting tank	CS66	PROC3	0.663	0.001	0.663
	Industrial - SU 3	Centrifuging of slurry of beads and process water	CS127	PROC3	0.663	0.001	0.663
	Industrial - SU 3	Drying of polystyrene powder/granules	CS12	PROC12	0.098	0.001	0.099
	Industrial - SU 3	Loading/packaging for transport to customers	CS128	PROC8b	0.147	0.016	0.163
	Industrial - SU 3	Steam-heating and expansion of expandable polystyrene granulate	CS129	PROC12	0.663	0.001	0.663
	Industrial - SU 3	Storage and ageing of partially expanded polystyrene granulate	CS129	PROC12	0.098	0.001	0.099
	Industrial - SU 3	Moulding and block forming with expanded polystyrene granulate	CS130	PROC12	0.663	0.001	0.663
	Industrial - SU 3	Storage and cutting of expanded polystyrene articles	CS131	PROC12	0.098	0.001	0.099
	Industrial - SU 3	Injection and mixing into pre-reaction component in blending tank	CS29	PROC3	0.098	0.001	0.099
	Industrial - SU 3	Drum filling blended mix	CS6, CS45	PROC9	0.196	0.016	0.212
	Industrial - SU 3	Foam production through mixing of reactive components	CS132	PROC12	0.098	0.001	0.099
	Industrial - SU 3	Foam compression to expel residual blowing agent	CS133	PROC12	0.098	0.001	0.099
	Industrial - SU 3	Foam article automated cutting	CS131	PROC12	0.098	0.001	0.099

1.8 Use in Agrochemicals – Professional

Table 1: Mapping Uses in the Supply Chain							
	User Group	Contributing Scenarios	CS Ref	Use Descriptor Process Category equivalent	**Substance Specific RCR (inhalation)**	**Substance Specific RCR (dermal)**	**Substance Specific RCR (all routes)**
Use in Agrochemicals	**Professional - SU22**	transfer from/pouring from containers	**CS22**	PROC8b Discharging to/from vessels	0.245	0.016	0.261
10 and 50 checked and GESs revised	**Professional - SU22**	mixing in containers	**CS23**	PROC4 Closed batch process (with sampling)	0.245	0.016	0.261
	Professional - SU22	spraying and fogging by manual application.	**CS24**	PROC11 - Non industrial spraying	0.589	0.248	0.837
	Professional - SU22	spraying and fogging by machine application	**CS25**	PROC11 - Non industrial spraying	0.589	0.248	0.837
	Professional - SU22	small ad hoc application via dipping, trigger sprays, etc	**CS27**	PROC13 - Treatment of articles by dipping and pouring	0.245	0.032	0.277
	Professional - SU22	cleandown and maintenance of equipment	**CS26**	PROC8a Discharging to/from vessels	0.491	0.032	0.523
	Professional - SU22	disposal of wastes	**CS28**	PROC8a Discharging to/from vessels	0.491	0.032	0.523
	Professional - SU22	Storage	**CS67**	PROC1	0.000	0.001	0.001
	Professional - SU23	Storage	**CS67**	PROC2 Closed continuous process (sometimes with sampling)	0.049	0.003	0.052

1.9 Use as a Fuel – Industrial

Table 1: Mapping Uses in the Supply	User Group	Contributing Scenarios	CS Ref	Use Descriptor / Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Use as a fuel	**Industrial -SU3**	Bulk transfers (barge, rail and road)	**CS14**	PROC8b Dedicated Discharging to/from vessels	0.147	0.016	0.163
	Industrial -SU3	Transfers from drums and containers	**CS8**	PROC8b Dedicated Discharging to/from vessels	0.147	0.016	0.163
	Industrial -SU3	General use exposures as a fuel	**CS15**	PROC1 Use as a fuel	0.000	0.001	0.001
	Industrial -SU3	General use exposures as a fuel	**CS15**	PROC2 Use as a fuel	0.049	0.003	0.052
	Industrial -SU3	Use a fuel	**CS15 CS107**	PROC16 - use as a fuel	0.025	0.001	0.025
	Industrial -SU3	Use a fuel additive diluent	**CS15 CS107**	PROC3 Closed batch process (with sampling)	0.098	0.001	0.099
	Industrial -SU3	Vehicle/boiler maintenance	**CS39 (changed from CS5)**	PROC8a Non-dedicated Discharging to/from vessels	0.245	0.032	0.277
	Industrial -SU3	Cleaning fuel storage tanks	**CS103**	PROC8a Discharging to/from vessels	0.245	0.032	0.277
	Industrial -SU3	Storage	**CS67**	PROC1 Closed continuous process (sometimes with sampling)	0.000	0.001	0.001
	Industrial -SU3	Storage	**CS67**	PROC2 Closed continuous process (sometimes with sampling)	0.049	0.003	0.052

1.10 Use as a Fuel – Professional

Table 1: Mapping Uses in the Supply	User Group	Contributing Scenarios	CS Ref	Use Descriptor / 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**	PROC8b Dedicated Discharging to/from vessels	0.245	0.016	0.261
	~~Professional - SU22~~	Transfers from drums and containers	**CS8**	PROC8b Dedicated Discharging to/from vessels	0.245	0.016	0.261
	~~Professional - SU22~~	Refuelling vehicles, light aircraft or marine	**CS-I Refuelling - Concawe**	PROC8b Dedicated Discharging to/from vessels	0.245	0.016	0.261
	~~Professional - SU22~~	General use exposures as a fuel	**CS15**	PROC1 Use as a fuel	0.000	0.001	0.001
	~~Professional - SU22~~	General use exposures as a fuel	**CS15**	PROC2 Use as a fuel	0.049	0.003	0.052
	~~Professional - SU22~~	Use a fuel additive diluent	~~**CES16,**~~ **CS15 CS107**	PROC3 Closed batch process (with sampling)	0.098	0.001	0.099
	~~Professional - SU22~~	Use a fuel	~~**CES16,**~~ **CS15 CS107**	PROC16 - use as a fuel	0.049	0.001	0.050
	~~Professional - SU22~~	Equipment maintenance e.g. Vehicle, boiler, pump maintenance, pump calibration	**CS39**	PROC8a Discharging to/from vessels	0.491	0.032	0.523
	~~Professional - SU22~~	Vessel / container cleaning	**CS103**	PROC8a Discharging to/from vessels	0.491	0.032	0.523
	~~Professional - SU22~~	Storage	**CS67**	PROC1 Closed continuous process (sometimes with sampling)	0.000	0.001	0.001

1.11 Use as Functional Fluids – Industrial

	Table 1: Mapping Uses in the Supply			Use Descriptor / Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
	User Group	Contributing Scenarios	CS Ref				
Functional fluids	**Industrial -SU10**	Bulk transfers to/from storage	**CS14, CS107**	PROC1 Closed continuous process (sometimes with sampling)	0.000	0.001	0.001
	Industrial -SU10	Bulk transfers to/from storage	**CS14, CS107**	PROC2	0.049	0.003	0.052
10 and 50 checked and GESs revised	**Industrial -SU10**	Transfers from drums to filling machinery	**CS8**	PROC8b Discharging to/from vessels	0.147	0.016	0.163
	Industrial -SU10	filling articles from predominantly enclosed machines	**CS53 delete, CS84, CS107**	PROC9 Transfer of chemicals into small containers	0.196	0.016	0.212
	Industrial -SU10	manual filling of machines	**CS45**	PROC8a Discharging to/from vessels (non-dedicated)	0.245	0.032	0.277
	Industrial -SU10	operation of closed equipment containing functional fluids	**CS15**	PROC2	0.049	0.003	0.052
	Industrial -SU10	operation of open equipment containing functional fluids at **elevated temperatures**	**CS16**	PROC4 Use in batch and other process	0.663	0.016	0.678
	Industrial -SU10	Re-work on off specification articles	**CS19**	PROC9 Transfer of chemicals into small containers	0.196	0.016	0.212
	Industrial -SU10	maintenance of equipment	**CS5**	PROC8a Discharging to/from vessels (non-dedicated)	0.245	0.032	0.277
	Industrial -SU3	Storage	**CS67**	PROC1 Closed continuous process (sometimes with sampling)	0.000	0.001	0.001
	Industrial -SU3	Storage	**CS67**	PROC2 Closed continuous process (sometimes with sampling)	0.049	0.003	0.052

1.12 Use as Functional Fluids – Professional

Table 1: Mapping Uses in the Supply

	User Group	Contributing Scenarios	CS Ref	Use Descriptor / Process Category equivalent	Substance Specific RCR (inhalation)	Substance Specific RCR (dermal)	Substance Specific RCR (all routes)
Functional fluids	**Professional - SU22**	Transfers from drums to filling machinery	**CS8**	PROC8a Discharging to/from vessels (non-dedicated)	0.491	0.032	0.523
	Professional - SU22	filling from small containers e.g. cans	**CS22**	PROC9 Transfer of chemicals into small containers	0.245	0.016	0.261
	Professional - SU22	manual filling from drums	**CS45**	PROC9 Transfer of chemicals into small containers	0.245	0.016	0.261
	Professional - SU22	operation of equipment containing functional fluids	**CS15**	PROC1	0.000	0.001	0.001
	Professional - SU22	operation of equipment containing functional fluids	**CS15**	PROC2 Closed continuous process (sometimes with sampling)	0.049	0.003	0.052
	Professional - SU22	operation of equipment containing functional fluids	**CS15**	PROC3	0.098	0.001	0.099
	Professional - SU22	operation of equipment containing functional fluids	**CS16**	PROC20 Heat and pressure transfer fluids (closed systems)	0.049	0.004	0.053
	Professional - SU22	operation of equipment containing functional fluids at **elevated temperatures**	**CS16**	PROC20 Heat and pressure transfer fluids (closed systems)	0.663	0.016	0.678
	Professional - SU22	Re-work on off specification articles	**CS19**	PROC9 - Transfer of chemicals into small containers	0.245	0.016	0.261
	Professional - SU22	maintenance of equipment	**CS5**	PROC8a Discharging to/from vessels (non-dedicated)	0.491	0.032	0.523
	Professional - SU22	Storage	**CS67**	PROC1 Closed continuous process (sometimes with sampling)	0.000	0.001	0.001
	Professional - SU22	Storage	**CS67**	PROC2 Closed continuous process (sometimes with sampling)	0.049	0.003	0.052

1.13 Use in Laboratory Applications – Industrial

Table 1: Mapping Uses in the Supply Chain							
	User Group	Contributing Scenarios	CS Ref	Use Descriptor / Process Category equivalent	**Substance Specific RCR (inhalation)**	**Substance Specific RCR (dermal)**	**Substance Specific RCR (all routes)**
Use in laboratories	**Industrial - SU3, 8, etc**	CS36 Laboratory activities	**CS36**	PROC15	0.049	0.001	0.050
	Industrial - SU3, 8, etc	CS47 Cleaning [wiping, brushing, flushing]	**CS47**	PROC10	0.245	0.063	0.309

1.14 Use in Laboratory Applications – Professional

Table 1: Mapping Uses in the Supply Chain							
	User Group	Contributing Scenarios	CS Ref	Use Descriptor / 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**	PROC15	0.049	0.001	0.050
	Professional - SU22	CS47 Cleaning [wiping, brushing, flushing]	**CS47**	PROC10	0.491	0.063	0.554

Appendix 3B
Exposure Estimations – consumer

1.1 Uses in Coatings – Consumer

Table 1: Mapping Consumer Uses in the Supply Chain

Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels		Risk Characterization - including RMMs when needed (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)
					d	o	i	t
Coating	Consumer-SU21	PC1:Adhesives, sealants	Glues, hobby use	Based upon daily use	0.00		0.01	0.01
Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.	Consumer-SU21	PC1:Adhesives, sealants	Glues DIY-use (carpet glue, tile glue, wood parquet glue)	Based upon infrequent use (<365 days/yr)	0.00		0.03	0.03
PC1, PC4, PC8, PC9, PC15, PC18, PC23, PC24, PC31,PC34, (PC5, PC10)	Consumer-SU21	PC1:Adhesives, sealants	Glue from spray	Based upon daily use	0.00		0.13	0.13
	Consumer-SU21	PC1:Adhesives, sealants	Sealants	Based upon daily use	0.00		0.05	0.05
	Consumer-SU21	PC4_n:Anti-freeze and de-icing products	Washing car window	Based upon daily use			0.00	0.00
	Consumer-SU21	PC4_n:Anti-freeze and de-icing products	Pouring into radiator	Based upon daily use	0.00		0.00	0.00
		PC4_n:Anti-freeze and de-icing products	Lock de-icer	Based upon daily use	0.00		0.00	0.00
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Laundry and dish washing products	Based upon daily use	0.00		0.00	0.00
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Based upon daily use	0.00		0.00	0.00
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Based upon daily use	0.00		0.00	0.00
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Waterborne latex wall paint	Based upon daily use	0.00		0.16	0.16
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Solvent rich, high solid, water borne paint	Based upon daily use	0.00		0.81	0.81
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Aerosol spray can	Based upon daily use			0.05	0.05
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Removers (paint-, glue-, wall paper-, sealant-remover)	Based upon daily use	0.00		0.93	0.93
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Fillers and putty	Based upon daily use	0.00		0.01	0.01
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Plasters and floor equalizers	Based upon infrequent use (<365 days/yr)	0.00		0.03	0.03
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Modelling clay	Based upon daily use		0.00	#DIV/0!	0.00
	Consumer-SU21	PC9c:Finger paints	Finger paints	Based upon daily use		0.32	#DIV/0!	0.32
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Waterborne latex wall paint	Based upon daily use	0.00		0.16	0.16
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Solvent rich, high solid, water borne paint	Based upon daily use	0.00		0.81	0.81
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Aerosol spray can	Based upon daily use			0.05	0.05
	Consumer-SU21	PC15_n: Non-metal surface treatment products	Removers (paint-, glue-, wall paper-, sealant-remover)	Based upon daily use	0.00		0.93	0.93
	Consumer-SU21	PC18_n: Ink and toners	Inks and toners.	Based upon daily use	0.00		0.02	0.02
	Consumer-SU21	PC23_n: Leather tanning, dye, finishing, impregnation and care products	Polishes, wax / cream (floor, furniture, shoes)	Based upon daily use	0.00		0.08	0.08
	Consumer-SU21	PC23_n: Leather tanning, dye, finishing, impregnation and care products	Polishes, spray (furniture, shoes)	Based upon daily use	0.00		0.03	0.03
	Consumer-SU21	PC24: Lubricants, greases, and release products	Liquids	Based upon daily use	0.00		0.01	0.01
	Consumer-SU21	PC24: Lubricants, greases, and release products	Pastes	Based upon daily use			#VALUE!	
	Consumer-SU21	PC24: Lubricants, greases, and release products	Sprays	Based upon daily use	0.00		0.02	0.02
	Consumer-SU21	PC31:Polishes and wax blends	Polishes, wax / cream (floor, furniture, shoes)	Based upon daily use	0.00		0.20	0.20
	Consumer-SU21	PC31:Polishes and wax blends	Polishes, spray (furniture, shoes)	Based upon daily use	0.00		0.02	0.02
	Consumer-SU21	PC34_n: Textile dyes, finishing and impregnating products		Based upon daily use	0.00		0.03	0.03

1.2 Uses in Cleaning – Consumer

Table 1: Mapping Consumer Uses in the Supply Chain

Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels		Risk Characterization - including RMMs when needed (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)
					d	o	i	t
Cleaning	Consumer-SU21	PC3:Air care products	Air care, instant action (aerosol sprays)	Based upon daily use			0.00015	0.00015
Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products.	Consumer-SU21	PC3:Air care products	Air care, instant action (aerosol sprays)-pesticidal-excipient only	Based upon daily use			0.00752	0.00752
PC3, PC4, PC8 (excipient only), PC9, PC24, PC35, PC38	Consumer-SU21	PC3:Air care products	Air care, continuous action (solid and liquid)	Based upon daily use	0.00		0.00026	0.00026
	Consumer-SU21	PC3:Air care products	Air care, continuous action (solid and liquid)-pesticidal-excipient only	Based upon daily use	0.00		0.00129	0.00129
	Consumer-SU21	PC4_n:Anti-freeze and de-icing products	Washing car window	Based upon daily use			0.00000	0.00000
	Consumer-SU21	PC4_n:Anti-freeze and de-icing products	Pouring into radiator	Based upon daily use	0.00		0.00281	0.00282
		PC4_n:Anti-freeze and de-icing products	Lock de-icer	Based upon daily use	0.00		0.00079	0.00080
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Laundry and dish washing products	Based upon daily use	0.00		0.00105	0.00105
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Based upon daily use	0.00		0.00131	0.00135
	Consumer-SU21	PC8_n: Biocidal products (excipient use only for solvent products)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Based upon daily use	0.00		0.00270	0.00271
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Waterborne latex wall paint	Based upon daily use	0.00		0.1638	0.1640
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Solvent rich, high solid, water borne paint	Based upon daily use	0.00		0.8097	0.8099
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Aerosol spray can	Based upon daily use			0.0533	0.0533
	Consumer-SU21	PC9a:Coatings and paints, fillers putties, thinners	Removers (paint-, glue-, wall paper-, sealant-remover)	Based upon daily use	0.00		0.9264	0.9267
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Fillers and putty	Based upon daily use	0.00		0.0083	0.0084
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Plasters and floor equalizers	Based upon infrequent use (<365 days/yr)	0.00		0.0342	0.0343
	Consumer-SU21	PC9b:Fillers, putties, plasters, modeling clay	Modelling clay	Based upon daily use	0.01	0.00		0.0166
	Consumer-SU21	PC9c:Finger paints	Finger paints	Based upon daily use	0.59	0.32		0.9098
	Consumer-SU21	PC24: Lubricants, greases, and release products	Liquids	Based upon daily use	0.00		0.0062	0.0062
	Consumer-SU21	PC24: Lubricants, greases, and release products	Pastes	Based upon daily use				
	Consumer-SU21	PC24: Lubricants, greases, and release products	Sprays	Based upon daily use	0.00		0.0188	0.0188
	Consumer-SU21	PC35:Washing and cleaning products (including solvent based products)	Laundry and dish washing products	Based upon daily use	0.00		0.0010	0.0011
	Consumer-SU21	PC35:Washing and cleaning products (including solvent based products)	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Based upon daily use	0.00		0.0013	0.0014
	Consumer-SU21	PC35:Washing and cleaning products (including solvent based products)	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Based upon daily use	0.00		0.0027	0.0027
	Consumer-SU21	PC38_n: Welding and soldering products, flux products	NOTE, n_assessment not in TRA	Based upon daily use			0.0058	0.0058

1.3 Use as a Fuel – Consumer

Table 1: Mapping Consumer Uses in the Supply Chain

Generic Exposure Scenario		Relevant Use Sentinel Product	Product sub Category Sentinels		Risk Characterization - including RMMs when needed (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)
					d	o	i	t
Fuels	Consumer-SU21	PC13:Fuels	Liquid - subcategories added: Automotive Refuelling	Based upon daily use	0.0000016		0.0023939	0.0023956
PC13	Consumer-SU21	PC13:Fuels	Liquid - subcategories added: Scooter Refuelling	Based upon daily use	0.0000011		0.0015880	0.0015891
	Consumer-SU21	PC13:Fuels	Liquid - subcategories added: Garden Equipment - Use	Based upon daily use			0.0113207	0.0113207
	Consumer-SU21	PC13:Fuels	Liquid (subcategories added): Garden Equipment - Refueling	Based upon daily use	0.0000020		0.0012580	0.0012599
		PC13:Fuels	Liquid (subcategories added): Home space heater fuel	Based upon daily use	0.0000010		0.0003612	0.0003622
	Consumer-SU21	PC13:Fuels	Liquid - subcategories added: Lamp oil	Based upon daily use	0.0000004		0.0002098	0.0002102

1.4 Other Uses – Consumer

Table not applicable

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. Storage: • P403: Store in a well-ventilated place.	***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*

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. Response: • P303 + P361 + P353 : IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with	**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).* **Substance** • *Avoid Overfilling (Industrial/ Professional).*

Hazard	Material	Risk / Hazard Phrase	P Phrase	Qualitative Risk Assessment
			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. 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.	**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).* **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).*

Hazard	Material	Risk / Hazard Phrase	P Phrase	Qualitative Risk Assessment
			• P501 : Dispose of contents/container to	• *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. 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. • P501 : Dispose of contents/container to	• ***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).* **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).

Annex III
"Exposure Estimation for Environment"
(PETRORISK file)

Annex III is updated in HSRC Consortium and will be sent to you after formal presentation