EG-Sicherheitsdatenblatt

ABSCHNITT 1: Bezeichnung des Stoffs bzw. des Gemischs und des Unternehmens

1.1. Produktidentifikator

Handelsname
Orangenterpene

Name des Stoffs	Orange, süß, Extrakt
REACH-Registrierungsnummer:	01-2119493353-35

Identifikationsnummern

CAS-Nummer	8028-48-6
EG-Nummer	232-433-8

1.2. Relevante identifizierte Verwendungen des Stoffs oder Gemischs und Verwendungen, von denen abgeraten wird

Relevante identifizierte Verwendungen
Zutaten für Aroma-und Duftstoffen.
Formulierung von Duftstoffen und Reinigungsmitteln
(Kosmetik)

Verwendungen, von denen abgeraten wird
Keine weiteren relevanten Informationen verfügbar.

1.3. Einzelheiten zum Lieferanten, der das Sicherheitsdatenblatt bereitstellt

Lieferant
SysKem Chemie GmbH
Brucknerweg 26
D-42289 Wuppertal

Telefon-Nummer	+49 (0) 202/30999510
Fax-Nummer	+49 (0) 202/87088403
Email	info@syskem.de

Email-Adresse der sachkundigen Person, die für das Sicherheitsdatenblatt zuständig ist
info@syskem.de

1.4. Notrufnummer

Vergiftungs-Informations-Zentrale Freiburg, Tel. +49 761 19240.

ABSCHNITT 2: Mögliche Gefahren

2.1. Einstufung des Stoffs oder Gemischs

Einstufung gemäß Verordnung (EG) Nr. 1272/2008 (CLP)

Flam. Liq. 3	H226	Flüssigkeit und Dampf entzündbar
Asp. Tox. 1	H304	Kann bei Verschlucken und Eindringen in die Atemwege tödlich sein
Skin Irrit. 2	H315	Verursacht Hautreizungen.
Skin Sens. 1B	H317	Kann allergische Hautreaktionen verursachen.
Aquatic Chronic 2	H411	G iftig für Wasserorganismen, mit langfristiger Wirkung

2.2. Kennzeichnungselemente

Kennzeichnung gemäß Verordnung (EG) Nr. 1272/2008 (CLP)
Gefahrenpiktogramme


GHS02


GHS07


GHS08


GHS09

Signalwort
Gefahr

Gefahrbestimmende Komponenten zur Etikettierung:
Orange, süß, Extrakt

Gefahrenhinweise

H226	Flüssigkeit und Dampf entzündbar.
H304	Kann bei Verschlucken und Eindringen in die Atemwege tödlich sein.
H315	Verursacht Hautreizungen.
H317	Kann allergische Hautreaktionen verursachen.
H411	Giftig für Wasserorganismen mit langfristiger Wirkung.

Sicherheitshinweise

P210	Von Hitze/Funken/offener Flamme/heißen Oberflächen fernhalten. Nicht rauchen.
P241	Explosionsgeschützte elektrische Geräte/Lüftungsanlagen/Beleuchtungsanlagen verwenden.
P301+P310	BEI VERSCHLUCKEN: Sofort GIFTINFORMATIONSZENTRUM/Arzt anrufen.
P303+P361+P353	BEI BERÜHRUNG MIT DER HAUT (oder dem Haar): Alle kontaminierten Kleidungsstücke sofort ausziehen. Haut mit Wasser abwaschen/duschen.
P405	Unter Verschluss aufbewahren.
P501	Entsorgung des Inhalts / des Behälters gemäß den örtlichen / regionalen / nationalen/ internationalen Vorschriften.

2.3. Sonstige Gefahren

Es liegen keine zusätzlichen Angaben vor.

Ergebnisse der PBT- und vPvB-Beurteilung
PBT: Nicht als PBT eingestuft.
vPvB: Nicht als vPvB eingestuft

ABSCHNITT 3: Zusammensetzung/Angaben zu den Bestandteilen

3.1. Stoffe

CAS-Nr.	Bezeichnung
8028-48-6	Orange, süß, Extrakt (Orange, sweet, ext.) (*)

- Identifikationsnummer(n)
- EC-Nummer: 232-433-8

- zusätzliche Hinweise
(*) UVCB Substance
(*) Other identifiers: (R)-p-mentha-1,8-diene CAS 5989-27-5

3.2. Gemische

Nicht zutreffend. Das Produkt ist kein Gemisch.

ABSCHNITT 4: Erste-Hilfe-Maßnahmen

4.1. Beschreibung der Erste-Hilfe-Maßnahmen

Allgemeine Anmerkungen
Mit Produkt verunreinigte Kleidungsstücke unverzüglich entfernen.
Selbstschutz des Ersthelfers.

Nach Inhalation
Reichlich Frischluftzufuhr und sicherheitshalber Arzt aufsuchen.
Bei Bewusstlosigkeit Lagerung und Transport in stabiler Seitenlage.

Nach Kontakt mit der Haut
Mit Produkt verunreinigte Kleidungsstücke unverzüglich entfernen.
Sofort gründlich mit Wasser abwaschen und gut nachspülen. Bei andauernder Hautreizung Arzt aufsuchen.

Nach Berührung mit den Augen
Kontaktlinsen entfernen.
Augen mehrere Minuten bei geöffnetem Lindspalt unter fließendem Wasser spülen. Bei anhaltenden Beschwerden Arzt konsultieren.

Nach Aufnahme durch Verschlucken
Kein Erbrechen herbeiführen außer bei ausdrücklicher Anweisung durch medizinisches Personal. Niemals einer bewusstlosen Person etwas durch den Mund verabreichen. Bei Bewusstlosigkeit in stabile Seitenlage bringen und sofort ärztliche Hilfe hinzuziehen. Bei erhaltenem Bewusstsein Mund mit Wasser ausspülen.

4.2. Wichtigste akute und verzögert auftretende Symptome und Wirkungen

Hautreizung
Allergische Hautreaktionen.

4.3. Hinweise auf ärztliche Soforthilfe oder Spezialbehandlungen

Ärtzlicher Behandlung zuführen.

ABSCHNITT 5: Maßnahmen zur Brandbekämpfung

5.1. Löschmittel

Geeignete Löschmittel:
CO 2 , Löschpulver oder Wassersprühstrahl. Größeren Brand mit Wassersprühstrahl oder alkoholbeständigem Schaum bekämpfen.

Ungeeignete Löschmittel:
Wasser im Vollstrahl.

5.2. Besondere vom Stoff oder Gemisch ausgehende Gefahren

Kann explosive Gas-Luft-Gemische bilden.
Kohlenoxide (COx)

5.3. Hinweise für die Brandbekämpfung

Besondere Schutzausrüstung:
Explosions- und Brandgase nicht einatmen.
Zugelassenen ortsunabhängigen Überdruck-Preßluftatmer bzw. umluftunabhängiges Atemschutzgerät anlegen sowie Feuerwehrschutzkleidung (Feuerwehr-Helm mit Nackenschutz, -Schutzanzug, -Schutzschuhwerk und-Schutzhandschuhe) tragen.
Weitere Angaben
Entzündlich. Gefährdete Behälter mit Wassersprühstrahl kühlen.Wasser kann nicht in Behältern gehen.

ABSCHNITT 6: Maßnahmen bei unbeabsichtigter Freisetzung

6.1. Personenbezogene Vorsichtsmaßnahmen, Schutzausrüstungen und in Notfällen anzuwendende Verfahren

Schutzausrüstung tragen. Ungeschützte Personen fernhalten.
Zündquellen fernhalten.
Für ausreichende Lüftung sorgen.

6.2. Umweltschutzmaßnahmen

Nicht in die Kanalisation oder in Gewässer gelangen lassen.
Bei Eindringen in Gewässer oder Kanalisation zuständige Behörden benachrichtigen.

6.3. Methoden und material für Rückhaltung und Reinigung

Mit flüssigkeitsbindendem material (Sand, Kieselgur, Säurebinder, Universalbinder, Sägemehl) aufnehmen.
Mechanisch aufnehmen.
In geeigneten Behältern der Rückgewinnung oder Entsorgung zuführen.
Das aufgenommene material vorschriftsmäßig entsorgen.

6.4. Verweis auf andere Abschnitte

Informationen zur Entsorgung siehe Abschnitt 13.
Informationen zur persönlichen Schutzausrüstung siehe Abschnitt 8.

ABSCHNITT 7: Handhabung und Lagerung

7.1. Schutzmaßnahmen zur sicheren Handhabung

In gut verschlossenen Gebinden kühl und trocken lagern.

Hinweise zum Brand- und Explosionsschutz:
Zündquellen fernhalten - nicht rauchen.

7.2. Bedingungen zur sicheren Lagerung unter Berücksichtigung von Unverträglichkeiten

Lagerung:
- Anforderung an Lagerräume und Behälter:
Nur im Originalgebinde aufbewahren.

- Zusammenlagerungshinweise:
Unverträgliche Produkte:
starke Oxidationsmittel
starke Säuren

- Weitere Angaben zu den Lagerbedingungen:
Behälter dicht geschlossen halten.
Vor Hitze und direkter Sonnenbestrahlung schützen.
Behälter an einem gut gelüfteten Ort aufbewahren.

- Klassifizierung nach Betriebssicherheitsverordnung (BetrSichV):
Entzündbare Flüssigkeiten

7.3. Spezifische Endanwendungen

Keine weiteren relevanten Informationen verfügbar.

ABSCHNITT 8: Begrenzung und Überwachung der Exposition/Persönliche Schutzausrüstungen

8.1. Zu überwachende Parameter

Grenzwerte für die berufsbedingte Exposition (Arbeitsplatzgrenzwerte)

Land	Arbeitsstoff	CAS	Identifikator	SMW ppm	SMW mg/m3	KZW ppm	KZW mg/m3	Quelle
DE	(R)-p-Mentha-1,8-dien	5989-27-5	AGW	5	28	20	112	TRGS 900

Hinweis

KZW Kurzzeitwert (Grenzwert für Kurzzeitexposition): Grenzwert der nicht überschritten werden soll, auf eine Dauer von 15 Minuten bezogen (soweit nicht anders angegeben)

SMW Schichtmittelwert (Grenzwert für Langzeitexposition): Zeitlich gewichteter Mittelwert, gemessen oder berechnet für einen Bezugszeitraum von acht Stunden (soweit nicht anders angegeben)

DNEL-Werte

8028-48-6 Orange, süß, Extrakt

Oral	DNEL Long term exposure - systemic effects	4,44 mg/kg bw/day (consumers)
Dermal	DNEL Acute - Local effects	92,2 µg/cm2 (consumers) 185,8 µg/cm2 (wrk)
	DNEL Long-Term exposure-systemic effects	4,44 mg/kg/ bw/day (consumers) 8,89 mg/kg/ bw/day (wrk)
Inhalativ	DNEL Long-Term exposure-systemic effects	7,78 mg/m3 (consumers) 31,1 mg/m3 (wrk)

PNEC-Werte

8028-48-6 Orange, süß, Extrakt

Oral	PNEC oral	13,3 mg/kg (food) Factor: 90; NOAL = 600 mg/kg bw, male rat 90 day
	PNEC	0,54 µg/l (sea water) Factor: 500; min valueEC50= 0.27 mg/l 5,4 µg/l (freshwater) Factor: 50; min. value EC50= 0.27 mg/l
	PNEC	0,61 mg/kg (soil) log Kow extrapolation
	PNEC	2,1 mg/l (STP) Factor: 10; NOEC = 21 mg/l
	PNEC aqua	5,77 µg/l (intermittent releases) Factor: 100; min. value LC50 (Daphnia) = 0.577 mg/l
	PNEC sediment	0,13 mg/kg (sea water) (sediment) log kow extrapolation 1,3 mg/kg (freshwater) (sediment) log Kow extrapolation

8.2. Begrenzung und Überwachung der Exposition

Geeignete technische Kontrolle
Zündquellen fernhalten
Für gute Belüftung/Absaugung am Arbeitsplatz sorgen.

Individuelle Schutzmaßnahmen (persönliche Schutzausrüstung)
Allgemeine Schutz- und Hygienemaßnahmen:
Die üblichen Vorsichtsmaßnahmen beim Umgang mit Chemikalien sind zu beachten.
Beschmutzte, getränkte Kleidung sofort ausziehen.
Waschen Sie Ihre Hände vor und nach der Arbeit.
Berührung mit den Augen und der Haut vermeiden.
Gase/Dämpfe/Aerosole nicht einatmen.

Atemschutz
Atemschutz empfehlenswert.
Filter A (Filter für organische Dämpfe) (EN 141)
Bei intensiver bzw. längerer Exposition umluftunabhängiges Atemschutzgerät verwenden.

Augen-/Gesichtsschutz
Dichtschließende Schutzbrille.
Ausrüstung sollte EN 166 entsprechen.

Handschutz
Schutzhandschuhe.
Chemikalienbeständige Handschuhe (EN 374)
Das Handschuhmaterial muss undurchlässig und beständig gegen das Produkt / den Stoff / die Zubereitung sein.
Schutzhandschuhe vor jeder Benutzung auf ihren ordnungsgemäßen Zustand prüfen.

Handschuhmaterial
Nitrilkautschuk
Handschuhe aus PVC.

Durchdringungszeit des Handschuhmaterials
Die genaue Durchbruchzeit ist beim Schutzhandschuhhersteller zu erfahren und einzuhalten.

Körperschutz:
Schutzanzug verwenden.
Tragen Sie Arbeitskleidung mit langen Ärmeln.

Begrenzung und Überwachung der Umweltexposition
Das Eindringen in die Kanalisation oder in Oberflächen- und Grundwasser verhindern.

ABSCHNITT 9: Physikalische und chemische Eigenschaften

9.1. Angaben zu den grundlegenden physikalischen und chemischen Eigenschaften

Aggregatzustand	flüssig
Form	Flüssigkeit
Farbe	Hellgelb
Geruch	Süße Orangen
Geruchsschwelle	Nicht bestimmt
pH-Wert	Nicht bestimmt
Schmelzpunkt/Gefrierpunkt:	< -25 °C
Siedebeginn und Siedebereich:	160 °C (OECD Guideline 103)
Zersetzungspunkt/Zersetzungsbereich	Nicht bestimmt
Flammpunkt	53,4 ± 1,0 °C (ASTM D7094)
Zündtemperatur	Nicht bestimmt
Selbstentzündungstemperatur	Nicht bestimmt
Oxidierende Eigenschaften	Nicht oxidierend
Explosive Eigenschaften	Das Produkt ist nicht explosionsgefährlich.
Entzündbarkeit (fest, gasförmig)	Nicht anwendbar.
Untere Entzündbarkeits- oder Explosionsgrenze	Nicht bestimmt.
Obere Entzündbarkeits- oder Explosionsgrenze	Nicht bestimmt.
Dampfdruck	186,4 Pa bei 25 °C
Dampfdichte	0,0149 g/l
Verdampfungsgeschwindigkeit	Nicht bestimmt.
Relative Dichte	0,8455 ±0,0002 g/ml (OECD 109)
Dichte	Keine Daten vorhanden.
Wasserlöslichkeit	Nicht bzw. wenig mischbar
Löslichkeit(en)	Keine Daten vorhanden.

Verteilungskoeffizient: n-Octanol/Wasser	4,38 log Pow
Viskosität	
dynamisch	0,99 mPas (DIN 53015)
kinematisch	1,17 mm2/s (DIN 53015)

9.2. Sonstige Angaben

Temperaturklasse (EU gem. ATEX)	T3

ABSCHNITT 10: Stabilität und Reaktivität

10.1. Reaktivität

Möglichkeit von gefährliche Reaktionen.

10.2. Chemische Stabilität

Stabil bei regulärer Nutzungsbedingungen.

10.3. Möglichkeit gefährlicher Reaktionen

Reaktionen mit Oxidationsmitteln.

10.4. Zu vermeidende Bedingungen

Wärme-und Zündquellen

10.5. Unverträgliche materialien

Starke Oxidationsmittel. Starke Säuren

10.6. Gefährliche Zersetzungsprodukte

Im Brandfall kann freigesetzt werden: Kohlenmonoxid und Kohlendioxid

Weitere Angaben:
Brennbarer Stoff.

ABSCHNITT 11: Toxikologische Angaben

11.1. Angaben zu toxikologischen Wirkungen

Akute Toxizität
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.

Einstufungsrelevante LD/LC50-Werte:
8028-48-6 Orange, süß, Extrakt

Oral	LD50 >5.000 mg/kg (Ratte) Method equivalent to OECD Guideline 401(Acute Oral Toxicity), Federal Hazardous Substance Act (FHSA) Rat (Wistar) male Oral: gavage Source: OM Moreno (1973a)
Dermal	LD50 >5.000 mg/kg (Kaninchen) Rabbit (New Zealand White) female Dermal: abraded abdominal skin Method equivalent to OECD Guideline 402 (Acute Dermal Toxicity) Federal Hazardous Substance Act (FHSA). Results: Moderate redness was noted in 10 out of 10 animals, slight edema in 3/10 and moderate edema in 5/10 animals. Source: OM Moreno (1973b)

Ätz-/Reizwirkung auf die Haut
Test on Kaninchen.
OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
Verursacht Hautreizungen.

Schwere Augenschädigung/-reizung
Keine reizende Wirkung.
Test on Kaninchen
OECD Guideline 405 (Acute Eye Irritation / Corrosion)

Sensibilisierung der Atemwege/Haut
OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)
Kann allergische Hautreaktionen verursachen.

CMR-Wirkungen (krebserzeugende, erbgutverändernde und fortpflanzungsgefährdende Wirkung)
Mutagenität
Orangenöl hat in den drei In-Vitro-Tests zur genetischen Toxizität kein gentoxisches Potential gezeigt. Es kann deshalb davon ausgegangen werden, dass der Stoff nicht mutagen ist und nicht anhand der Kriterien in Anhang I der Richtlinie 1272/2008/EWG (CLP / EU-GHS).
1) Verfahren:
Genetische Mutation an Bakterien (Ames-Test OECD 471)
Ergebnisse:
Nicht mutagen
- Referenzen: Dr. I.A.J. Verbaan (2010)
2) Verfahren:
Test auf Chromosomenaberrationen in Säugetierzellen (Mammalian chromosome aberration test OECD 473)
Ergebnisse:
Negativ ohne Stoffwechselaktivierung.
- Referenzen: I. Verspeek (2010)
3) Verfahren:
Test auf Genmutationen in Säugetierzellen (Mammalian cell gene mutation test OECD 476)
Ergebnisse:
Negativ
-Referenzen: M. Ishidate, Jr, T. Sofuni, K. Yoshikawa, M. Hayashi, T. Nohmi, M (1984)

Reproduktionstoxizität
Die Studien werden nicht von Spalte 2 Anhang VIII der REACh Verordnung verlangt, da es eine Toxizitätsstudie für die Reproduktivität von drei verschiedenen Spezies gibt, und wurden deshalb nicht durchgeführt.

Toxizität für Entwicklung / Teratogenese
Anhand der verfügbaren Tests liegt der NOAEL bei 591 mg/kg KGW/Tag. Es kann deshalb davon ausgegangen werden, dass der Stoff nicht mutagen ist und nicht anhand der Kriterien in Anhang I der Richtlinie 1272/2008/EWG (CLP / EU-GHS) eingestuft werden muss.
1) Verfahren:
- Ratte (Wistar)
- Verabreichung: oral
- Exposition: 7 Tage (1 x täglich)
Ergebnisse:
NOAEL (Toxizität Mutter): 591 mg/kg KGW/Tag
NOAEL (Toxizität Fötus): 591 mg/kg KGW/Tag
- Referenzen: Tsuji M, Fujisaki Y, Okubo A, Arikawa Y, Noda K, Ide H and Ikeda T (1975)
2) Verfahren:
- Kaninchen (Japanese white)
- Verabreichung: oral
- Exposition: 13 Tage (1 x täglich)
Ergebnisse:
NOAEL (Toxizität Mutter): 250 mg/kg KGW/Tag
NOAEL (Toxizität Fötus): 1000 mg/kg KGW/Tag
- Referenzen: Kodama R, Okubo A, Sato K, Araki E, Noda K, Ide H and Ikeda T (1977)

3) Verfahren:
- Maus (ICR)
- Verabreichung: oral
- Exposition: 6 Tage (1 x täglich)
Ergebnisse:
NOAEL (Toxizität Mutter): 591 mg/kg KGW/Tag
NOAEL (Toxizität Fötus): 591 mg/kg KGW/Tag
- Referenzen: Kodama R, Okubo A, Sato K, Araki E, Noda K, Ide H and Ikeda T (1977)

Karzinogenität
Der Karzinogenität an D-Limonene (OEDC 451) hat keine kanzerogenen Aktivitäten an Ratten und Mäusen ergeben. Es kann deshalb davon ausgegangen werden, dass der Stoff nicht kanzerogen ist und nicht anhand der Kriterien in Anhang I der Richtlinie 1272/2008/EWG (CLP / EU-GHS) eingestuft werden muss.
1) Verfahren:
- Maus männlich/weiblich
- Verabreichung: oral (Magensonde)
- Exposition: 103 Wochen (1 x täglich, 5 Tage pro Woche)
- Test: OECD Guideline 451 (Carcinogenicity Studies)
Ergebnisse:
Keine Wirkung
- Referenzen: Jameson CW (1990)
2) Verfahren:
- Ratte männliche/weibliche
- Verabreichung: oral (Magensonde)
- Exposition: 103 Wochen (1 x täglich, 5 Tage pro Woche)
- Test: OECD Guideline 451 (Carcinogenicity Studies)
Ergebnisse:
Neoplastische Wirkungen bei Männchen.Keine Wirkung bei Weibchen
- Referenzen: Jameson CW (1990)

Keimzell-Mutagenität
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.

Karzinogenität
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.

Reproduktionstoxizität
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.

Spezifische Zielorgan-Toxizität bei einmaliger Exposition
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.

Spezifische Zielorgan-Toxizität bei wiederholter Exposition
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.

Aspirationsgefahr
Kann bei Verschlucken und Eindringen in die Atemwege tödlich sein.

ABSCHNITT 12: Umweltbezogene Angaben

12.1. Toxizität

Aquatische Toxizität:
8028-48-6 Orange, süß, Extrakt

LC50/96h	0,702 mg/l (fish) (OECD Guideline 203 (Fish, Acute Toxicity Test)) Reference: Broderius 1990
EL50/48h	8,577 mg/l (Daphnia) ((test mat. WAF) Short term toxicity OECD 202) Results from measured concentration: EC50/48h = 0.895 mg/l Reference: Fresenius 05.12.20007 D-limonene results: EC50/48h = 0.421 mg/l; LC50/48h = 0.577 mg/l Reference:Broderius, 1990 1,1 mg/l (Daphnia) ((test mat. WAF) Acute Immobilisation Test OECD 202) Key study: NOEL/48h = 0.48 mg/l (test. mat WAF) Results from measured concentrations: EC50/48h = 0.67 mg d-limonene/l; NOEC/48h = 0.20 mg d-limonene/l D-limonene results: WAF - EL50/48h = >1.0 mg/l; NOEL/48h = 0.21 mg/l; EC50/48h = 0.36 mg/l; NOEC/48h= 0.074 mg/l Reference: Ibacon 2007
ErL50/72h	150 mg/l (algae) ((test mat. WAF) Toxicity to aquatic algae OECD 201) NOELr/72h = 50 mg/l (test. mat WAF) Results from geom. measured conc.: ErC50/72h = 8 mg/l (IR: hydrocarbons); NOECr/72h = 2.7 mg/l (IR: hydrocarbons) Reference: Fresenius 05.12.2007 D-limonene Result: Not relevat inhibition at 1.81 mg/l (96h) (Broderius, 1990)

12.2. Persistenz und Abbaubarkeit

Süßes Orangenöl ist gemäß Richtlinie OECD 301B als schnell biologisch abbaubar eingestuft und entspricht deshalb nicht dem Kriterium der Persistenz (Anhang XIII REACH Verordnung 1907/2006/EG).
Der CSB Wert ist 3280 gO2/kg.

12.3. Bioakkumulationspotential

Der Wert Log KOW ≤4,5 wurde aus dem Bioakkumulationsfaktor BCF = 361 (BCF < 2000) extrapoliert und zeigt an, dass der Stoff nicht bioakkumulierbar ist.

12.4. Mobilität im Boden

Die Studie wird nicht von Spalte 1 Anhang VII, VIII, IX, X und XIII der REACh Verordnung verlangt und wurde deshalb nicht durchgeführt.

12.5. Ergebnisse der PBT- und vPvB-Beurteilung

PBT: erfüllt nicht die Kriterien für die Einstufung als PBT
vPvB: erfüllt nicht die Kriterien für die Einstufung als vPvB

12.6. Andere schädliche Wirkungen

Es sind keine Daten verfügbar.

Weitere ökologische Hinweise:
Allgemeine Hinweise:
Giftig für Wasserorganismen

ABSCHNITT 13: Hinweise zur Entsorgung

13.1. Verfahren der Abfallbehandlung

Empfehlung:
Darf nicht zusammen mit Hausmüll entsorgt werden. Nicht in die Kanalisation gelangen lassen.
Muß unter Beachtung der Sonderabfallvorschriften nach Vorbehandlung einer hierfür zugelassenen Sonderabfallverbrennungsanlage zugeführt werden.

Abfallschlüsselnummer:
HP 3, HP 4, HP 13, HP 14 Reg.1357/2014/UE

Ungereinigte Verpackungen:
Empfehlung:
Entsorgung gemäß den behördlichen Vorschriften.
Die Verpackung ist nach Maßgabe der Verpackungsverordnung zu entsorgen.

ABSCHNITT 14: Angaben zum Transport

14.1.	**UN-Nummer**	2319
14.2.	**Ordnungsgemäße Versandbezeichnung**	Terpenkohlenwasserstoffe, n.a.g.
14.3.	**Transportgefahrenklassen**	
	Klasse	3 Entzündbare flüssige Stoffe
14.4.	**Verpackungsgruppe**	II
14.5.	**Umweltgefahren**	Gewässergefährdend

14.6. Besondere Vorsichtsmaßnahmen für den Verwender

Die Vorschriften für gefährliche Güter (ADR) sind auch innerhalb des Betriebsgeländes zu beachten.

14.7. Massengutbeförderung gemäß Anhang II des MARPOL-Übereinkommens 73/78 und gemäß IBC-Code

Die Fracht wird nicht als Massengut befördert.

14.8 Angaben nach den einzelnen UN-Modellvorschriften

Beförderung gefährlicher Güter auf Straße, Schiene oder Binnenwasserstraßen (ADR/RID/ADN)

UN-Nummer	2319
Offizielle Benennung für die Beförderung	UN2319, TERPENKOHLENWASSERSTOFFE, N.A.G., 3, III, (D/E), umweltgefährdend
Klasse	3
Klassifizierungscode	F1
Verpackungsgruppe	III
Gefahrzettel	3, Fisch und Baum

Umweltgefahren	Ja (gewässergefährdend)
Freigestellte Mengen (EQ)	E1
Begrenzte Mengen (LQ)	5 L
Beförderungskategorie (BK)	3
Tunnelbeschränkungscode (TBC)	D/E
Nummer zur Kennzeichnung der Gefahr	30

Internationaler Code für die Beförderung gefährlicher Güter mit Seeschiffen (IMDG)

UN-Nummer	2319
Offizielle Benennung für die Beförderung	UN2319, TERPENE HYDROCARBONS, N.O.S., 3, III, 53,4°C c.c., MARINE POLLUTANT
Klasse	3
Meeresschadstoff (Marine Pollutant)	Ja (gewässergefährdend)
Verpackungsgruppe	III
Gefahrzettel	3, Fisch und Baum

Sondervorschriften (SV)	-
Freigestellte Mengen (EQ)	E1
Begrenzte Mengen (LQ)	5 L
EmS	F-E, S-D
Staukategorie (stowage category)	A

Internationale Zivilluftfahrt-Organisation (ICAO-IATA/DGR)

UN-Nummer	2319
Offizielle Benennung für die Beförderung	UN2319, TERPENE HYDROCARBONS, N.O.S., 3, III,
Klasse	3
Meeresschadstoff (Marine Pollutant)	Ja (gewässergefährdend)
Verpackungsgruppe	III
Gefahrzettel	3

Freigestellte Mengen (EQ)	E1
Begrenzte Mengen (LQ)	10 L

ABSCHNITT 15: Rechtsvorschriften

15.1. Vorschriften zu Sicherheit, Gesundheits- und Umweltschutz/spezifische Rechtsvorschriften für den Stoff oder das Gemisch

Einschlägige Bestimmungen der Europäischen Union (EU)
Regulation (EC) n° 1907/2006
Regulation (EC) n° 1272/2008
Regulation (EC) n° 830/2015
Regulation (EC) n° 487/2013
Authorization in accordance with REACH regulation (CE n. 1907/2006 and subsequent amendments and integration):
The product is not included in the list of substance of very high concern (SVHC) candidate for authorization.

Richtlinie 2012/18/EU
- Namentlich aufgeführte gefährliche Stoffe - ANHANG I Der Stoff ist nicht enthalten.
- Seveso-Kategorie
E2 Gewässergefährdend
P5c ENTZÜNDBARE FLÜSSIGKEITEN
- Mengenschwelle (in Tonnen) für die Anwendung in Betrieben der unteren Klasse 200 t
- Mengenschwelle (in Tonnen) für die Anwendung in Betrieben der oberen Klasse 500 t

VERORDNUNG (EG) Nr. 1907/2006 ANHANG XVII
Beschränkungsbedingungen: 3

Nationale Vorschriften (Deutschland)
Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (AwSV)
Wassergefährdungsklasse (WGK) 2 – deutlich wassergefährdend.
Kennnummer 3824

Technische Anleitung zur Reinhaltung der Luft (Deutschland)

Nummer	Stoffgruppe	Klasse	Konzentration	Massenstrom	Massen-konzentration	Hinweis
5.2.5	organische Stoffe		≥ 25 Gew.-%	0,5 kg / h	50 mg / m3	3)

Hinweis:
3) Der Massenstrom 0,50 kg/h oder die Massenkonzentration 50 mg/m3 darf, jeweils angegeben als Gesamtkohlenstoff, insgesamt nicht überschritten werden (ausgenommen staubförmige organische Stoffe).

Lagerung von Gefahrstoffen in ortsbeweglichen Behältern (TRGS 510) (Deutschland)
Lagerklasse (LGK): 3 (entzündliche Flüssigkeiten)

15.2. Stoffsicherheitsbeurteilung

Eine Stoffsicherheitsbeurteilung wurde durchgeführt.

ABSCHNITT 16: Sonstige Angaben

Die Angaben in diesem Sicherheitsdatenblatt entsprechen nach bestem Wissen unseren Erkenntnissen bei Drucklegung. Die Informationen sollen Ihnen Anhaltspunkte für den sicheren Umgang mit dem in diesem Sicherheitsdatenblatt genannten Produkt bei Lagerung, Verarbeitung, Transport und Entsorgung geben. Die Angaben sind nicht übertragbar auf andere Produkte. Soweit das Produkt mit anderen materialien vermengt, vermischt oder verarbeitet wird, oder einer Bearbeitung unterzogen wird, können die Angaben in diesem Sicherheitsdatenblatt, soweit sich hieraus nicht ausdrücklich etwas anderes ergibt, nicht auf das so gefertigte neue material übertragen werden.

Datenquellen, die zur Erstellung des Datenblattes verwendet wurden:
ECHA Registered Substances Database
Regulation (EC) n° 1907/2006
Regulation (EC) n° 1272/2008
Regulation (EC) n° 487/2013
Regulation (EC) n° 830/2015

Vollständiger Wortlaut der in Abschnitt 2 und 3 aufgeführten H- und EUH-Sätze
H226 Flüssigkeit und Dampf entzündbar.
H304 Kann bei Verschlucken und Eindringen in die Atemwege tödlich sein.
H315 Verursacht Hautreizungen.
H317 Kann allergische Hautreaktionen verursachen.
H411 Giftig für Wasserorganismen, mit langfristiger Wirkung.

Datenblatt ausstellender Bereich:
SysKem Chemie GmbH
Abt. Produktsicherheit
Telefon-Nummer +49 (0) 202/30999510

Schulungshinweise:
Unterweisungen über Gefahren und Schutzmaßnahmen an Hand der Betriebsanweisungen (TRGS 555).
Die Unterweisungen müssen vor Beginn der Beschäftigung und danach mindestens einmal jährlich erfolgen.

Gründe für Änderungen:
Abschnitt 12.
Abschnitt 15.

Abkürzungen und Akronyme:

2017/2398/EU Richtlinie des Europäischen Parlaments und des Rates zur Änderung der Richtlinie 2004/37/EG über den Schutz der Arbeitnehmer gegen Gefährdung durch Karzinogene oder Mutagene bei der Arbeit
ADN Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (Europäisches Übereinkommen über die internationale Beförderung gefährlicher Güter auf Binnenwasserstraßen)
ADR Accord européen relatif au transport international des marchandises dangereuses par route (Europäisches Übereinkommen über die internationale Beförderung gefährlicher Güter auf der Straße)
AGW Arbeitsplatzgrenzwert
AwSV Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen
CAS Chemical Abstracts Service (Datenbank von chemischen Verbindungen und deren eindeutigem Schlüssel, der CAS Registry Number)
CLP Verordnung (EG) Nr. 1272/2008 über die Einstufung, Kennzeichnung und Verpackung (Classification, Labelling and Packaging) von Stoffen und Gemischen
CMR Carcinogenic, Mutagenic or toxicic for Reproduction (krebserzeugend, erbgutverändernd oder fortpflanzungsgefährdend)
DGR Dangerous Goods Regulations (Gefahrgutvorschriften) Regelwerk für den Transport gefährlicher Güter, siehe IATA/DGR
DMEL Derived Minimal Effect Level (abgeleitete Expositionshöhe mit minimaler Beeinträchtigung)
DNEL Derived No-Effect Level (abgeleitete Expositionshöhe ohne Beeinträchtigung)
EINECS European Inventory of Existing Commercial Chemical Substances (europäisches Verzeichnis der auf dem Markt vorhandenen chemischen Stoffe)
ELINCS European List of Notified Chemical Substances (europäische Liste der angemeldeten chemischen Stoffe)
EmS Emergency Schedule (Notfall Zeitplan)
GHS "Globally Harmonized System of Classification and Labelling of Chemicals" "Global harmonisiertes System zur Einstufung und Kennzeichnung von Chemikalien", das die Vereinten Nationen entwickelt haben
IATA International Air Transport Association (Internationale Flug-Transport-Vereinigung)
IATA/DGR Dangerous Goods Regulations (DGR) for the air transport (IATA) (Regelwerk für den Transport gefährlicher Güter im Luftverkehr)
ICAO International Civil Aviation Organization (internationale Zivilluftfahrt-Organisation)
IMDG International Maritime Dangerous Goods Code (internationaler Code für die Beförderung gefährlicher Güter mit Seeschiffen)
Index-Nr. die Indexnummer ist der in Anhang VI Teil 3 der Verordnung (EG) Nr. 1272/2008 angegebene Identifizierungs-Code
IOELV Arbeitsplatz-Richtgrenzwert
KZW Kurzzeitwert
LGK Lagerklasse gemäß TRGS 510, Deutschland
MARPOL Internationales Übereinkommen zur Verhütung der Meeresverschmutzung durch Schiffe (Abk. von "Marine Pollutant")
NLP No-Longer Polymer (nicht-länger-Polymer)
PBT Persistent, Bioakkumulierbar und Toxisch
PNEC Predicted No-Effect Concentration (abgeschätzte Nicht-Effekt-Konzentration)
ppm parts per million (Teile pro Million)
REACH Registration, Evaluation, Authorisation and Restriction of Chemicals (Registrierung, Bewertung, Zulassung und Beschränkung chemischer Stoffe)
RID Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Ordnung für die internationale Eisenbahnbeförderung gefährlicher Güter)
SMW Schichtmittelwert
TRGS Technische Regeln für GefahrStoffe (Deutschland)
TRGS 900 Arbeitsplatzgrenzwerte (TRGS 900)
TRGS 903 Biologische Grenzwerte (TRGS 903)
VOC Volatile Organic Compounds (flüchtige organische Verbindungen)
vPvB very Persistent and very Bioaccumulative (sehr persistent und sehr bioakkumulierbar)

Annex
Exposure Scenarios
according to the REACH Regulation EC n. 1907/2006

Overview of all the exposure scenarios

ES Number	ES name	Contributing scenario	ERC	Specific categories
1	Blending / Compounding	1, 2, 3, 4, 5, 8a, 8b, 9	2	
2	Formulation	1 (liquid and solid) 2 (liquid and solid) 3 (liquid and solid) 4 (liquid and solid) 5 (liquid and solid) 8a (liquid and solid) 8b (liquid and solid) 9 (liquid and solid) 10, 14, 15 (liquid and solid)	2	AISE 1, 5 and 7 AISE 2, 8 and 10 and COLIPA 1, 14 and 15 AISE 3, 9 and 11 and COLIPA 2 and 16 AISE 12 and COLIPA 3 COLIPA 6 and 8 AISE 4 AISE 6 COLIPA 4, 7 and 9 COLIPA 10 CEPE 7 CEPE 8, 9 ESVOC 4 FEICA 2,3 EFCC2
3	Industrial use	1 (liquid and solid) 2 (liquid and solid) 3 (liquid and solid) 4 (liquid and solid) 5 (liquid and solid) 7 and 11 (liquid and solid) 8a (liquid and solid) 8b (liquid and solid) 9 (liquid and solid) 10, 14, 15 (liquid and solid) 19	4, 5	CEPE 15, 16a CEPE 17a ESVOC 11 ESVOC 13 ESVOC 38 FEICA 6,7 FEICA 8,9
4	Consumer use		8a, 8b, 8d, 8f, 9a, 9b, 10a, 11a	GES4_C

1. TITLE OF EXPOSURE SCENARIO	
Blending / Compounding	
Environment	
Formulation of preparations	ERC 2
Worker	
Formulation and distribution / compounding in closed system, no likelihood of exposure	PROC 1
Formulation and distribution / compounding in closed, continuous process with occasional controlled exposure	PROC 2
Formulation and distribution / compounding in closed batch process (synthesis or formulation)	PROC 3
Formulation and distribution / compounding in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Use as laboratory reagent	PROC 15

2. CONDITION OF USE AFFETTING EXPOSURE	
2.1 Control of environmental exposure	
2.1.1 Blending of mixtures and distribution	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.2 Compounding of fragrance oils (generic large/medium sites)	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.3 Compounding of fragrance oils (generic small sites)	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes

2.2 Control of workers exposure				
PROC 1: Formulation and distribution / compounding in closed system, no likelihood of exposure				
Product characteristics				
Concentration of the substance: up to 100%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Surface of skin exposed: one hand face only (240 cm 2) No restriction on general ventilation characteristics Indoor use assumed				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 2: Formulation and distribution / compounding in closed, continuous process with occasional controlled exposure				
Product characteristics				
Concentration of the substance: up to 100% (taken from summary)				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min Operation carried out for 30 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids (450 min.) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Substance type: Liquids (30 min.) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: transfer of liquid product with flow of 0.-1 l/min.	Containment level: Handling that reduces contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls.
Surface of skin exposed: two hands face (480 cm 2) No restriction on general ventilation characteristics Indoor use assumed				

Condition and measures related to personal protection, hygiene and health evaluation
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.

PROC 3: Formulation and distribution / compounding in closed batch process (synthesis or formulation)				
Product characteristics				
Concentration of the substance: up to 100%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Surface of skin exposed: one hand face only (240 cm 2) No restriction on general ventilation Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Medium level of containment [Inhalation: 99%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 4: Formulation and distribution / compounding in batch and other process (synthesis) where opportunity for exposure arises				
Product characteristics				
Concentration of the substance: up to 100%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Surface of skin exposed: one hand face only (240 cm 2) No restriction on general ventilation Indoor use assumed				

Condition and measures related to personal protection, hygiene and health evaluation
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.

PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)				
Product characteristics				
Concentration of the substance: up to 100% (taken from da summary)				
Amount used, frequency and duration of use/exposure				
Operation carried out for 60 min Operation carried out for 420 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids (60 min.) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: Falling liquids	Situation: Transfer of liquid product with flow of 100 - 1000 l/minute	Containment level: Handling that reduces contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Substance type: Liquids (420 min.) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: Activities with agitated surfaces	Situation: open surface 1 – 3 m 2	Containment level: n. a.
Surface of skin exposed: two hands face (480 cm 2) No restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities				
Product characteristics				
Concentration of the substance: up to 100%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: Transfer of liquid product with flow of 100 - 1000 l/minute	Containment level: open process
Surface of skin exposed: two hands (960 cm 2) Ventilation rate: 3 air changes per hour (ACH) Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level of containment [Inhalation: 90%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities				
Product characteristics				
Concentration of the substance: up to 100% (taken from summary)				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min (taken from pdf ART REPORT – Manufacture of Orange Oil in PROC				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: Transfer of liquid product with flow of 100 - 1000 l/minute	Containment level: Handling that reduces contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: 3 air changes per hour (ACH) Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection. Optional face shield; Eye protection.				

PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)				
Product characteristics				
Concentration of the substance: 10-50% (taken from summary)				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: Transfer of liquid product with flow of 100 - 1000 l/minute	Containment level: Handling that reduces contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: 3 air changes per hour (ACH) Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection. Optional face shield; Eye protection.				

PROC 15: use as laboratory reagent			
Product characteristics			
Concentration of the substance: up to 100% (taken from summary)			
Amount used, frequency and duration of use/exposure			
Activity Sampling	Near Field	Operation carried out for 30 min	
Activity Pipetting	Near Field	Operation carried out for 30 min	
Activity transfer of substance	Near Field	Operation carried out for 420 min	
Other operational conditions affecting workers exposure			
Activity class (sampling): falling liquids	Situation: Transfer of liquid open product with flow of 0.1 - 1 l/minute	Containment level: open process	Loading type: splash loading, where the liquid dispenser remains at the top of the reservoir and the liquid splashes freely
Activity class (pipetting): falling liquids	Situation: Transfer of liquid product with flow of < 0.1 l/minute	Containment level: Handling that reduces contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls (see next questions).	Loading type: submerged loading, where the liquid dispenser remains below the fluid level reducing the amount of aerosol formation
Activities with relatively undisturbed surfaces (no aerosol formation)	Situation: open surface < 0.1 m2	Containment level: n.a	Loading type: n.a
Surface of skin exposed: one hand face only (240 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed			
Condition and measures related to personal protection, hygiene and health evaluation			
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.			

3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE		
3.1 Blending of mixtures and distribution		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.264	**ERC – ERC2**
Air	1.58	**ERC – ERC2**
Soil	0	**ERC – ERC2**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.659 mg/kg ww	**0.05**
Marine Water Food Chain (Predators)	Local PEC: 0.059 mg/kg ww	**0.004**
Marine Water Food Chain (Top Predators)	Local PEC: 0.039 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.2 Compounding of fragrance oils (generic large/medium sites)		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.264	**SpERC**
Air	1.58	**SpERC**
Soil	0	**SpERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.659 mg/kg ww	**0.05**
Marine Water Food Chain (Predators)	Local PEC: 0.059 mg/kg ww	**0.004**
Marine Water Food Chain (Top Predators)	Local PEC: 0.039 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.3 Compounding of fragrance oils (generic small sites)		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.264	**SpERC**
Air	1.58	**SpERC**
Soil	0	**SpERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.659 mg/kg ww	**0.05**
Marine Water Food Chain (Predators)	Local PEC: 0.059 mg/kg ww	**0.004**
Marine Water Food Chain (Top Predators)	Local PEC: 0.039 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

Workers					
Contributing scenario	**Inhalation Long-term, systemic**	**Dermal Long-term, systemic**	**Dermal Acute local**	**Combined Routes (RCR)**	**Exposure estimation Method**
PROC 1	Exposure: 1.5 mg/m3 RCR = 0.048	Exposure: 0.007 mg/kg bw/day RCR = 7.713E-4	Exposure: 0.004 mg/cm2 RCR = 0.022	0.049	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 2	Exposure: 1.6 mg/m3 RCR = 0.051	Exposure: 0.027 mg/kg bw/day RCR = 0.003	Exposure: 0.008 mg/cm2 RCR = 0.043	0.054	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 3	Exposure: 1.6 mg/m3 RCR = 0.048	Exposure: 0.027 mg/kg bw/day RCR = 7.713E-4	Exposure: 0.004 mg/cm2 RCR = 0.022	0.049	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 4	Exposure: 6.1 mg/m3 RCR = 0.196	Exposure: 0.137 mg/kg bw/day RCR = 0.015	Exposure: 0.04 mg/cm2 RCR = 0.215	0.211	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 5	Exposure: 16 mg/m3 RCR = 0.515	Exposure: 0.274 mg/kg bw/day RCR = 0.031	Exposure: 0.08 mg/cm2 RCR = 0.431		Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure

PROC 8a	Exposure: 18 mg/m3 RCR = 0.579	Exposure: 0.274 mg/kg bw/day RCR = 0.031	Exposure: 0.04 mg/cm2 RCR = 0.215	0.61	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 8b	Exposure: 18 mg/m3 RCR = 0.579	Exposure: 0.137 mg/kg bw/day RCR = 0.015	Exposure: 0.04 mg/cm2 RCR = 0.215	0.594	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 9	Exposure: 18 mg/m3 RCR = 0.418	Exposure: 0.137 mg/kg bw/day RCR = 0.008	Exposure: 0.02 mg/cm2 RCR = 0.108	0.426	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 15	Exposure: 18 mg/m3 RCR = 0.45	Exposure: 0.137 mg/kg bw/day RCR = 7.713E-4	Exposure: 0.004 mg/cm2 RCR = 0.022	0.451	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure

4. SCALING FOR DOWNSTREAM USER

In order to adapt the operating conditions and the measurements of the risk management to the single corporate reality (scaling), downstream users may use the same calculation model used in the preparation of the data presented
EUSES 2.0 was used for estimation of environmental exposure
Advanced REACH tool (www.advancedreachtool.com) was used for estimation of workers exposure.

The determination of the levels of oil of sweet orange campaigns by environmental monitoring (environmental sampling at fixed locations and / or personal sampling) is a different approach to assess whether the downstream work within the limits set by the exposure scenario. Therefore the detection of concentrations below the DNEL documenting that the use of the substance takes place in conditions of safety (controlled risk).

1. TITLE OF EXPOSURE SCENARIO

Formulation

AISE 1, 5 and 7 Formulation of Detergents/Maintenance Products: Granular Detergent - Regular (large scale), Granular Detergent -Compact (small scale), Low Viscosity Liquids (large scale)
AISE 2, 8 and 10 and COLIPA 1, 14 and 15 - Formulation of Detergents/Maintenance Products: Granular Detergent -Regular (medium scale), Low Viscosity Liquids (medium scale), High Viscosity Liquids (large scale); Formulation of Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (large scale), body care soap (medium and large scale)
AISE 3, 9 and 11 and COLIPA 2 and 16 - Formulation of Detergents/Maintenance Products: Granular Detergent -Regular (small scale), Low Viscosity Liquids (small scale), High Viscosity Liquids (medium scale); Formulation Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (medium scale), body care soap (small scale)
AISE 12 and COLIPA 3 - Formulation of Detergents/Maintenance Products: High Viscosity Liquids (small scale) Formulation of Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (small scale) COLIPA 6 and 8 - Formulation of Cosmetics: Medium Viscosity Body Care Products (medium scale), Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (large scale)
COLIPA 6 and 8 - Formulation of Cosmetics: Medium Viscosity Body Care Products (medium scale), Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (large scale)
AISE 4 - Formulation of Detergents/Maintenance Products: Granular Detergent -Compact (large scale)
AISE 6 - Formulation of Detergents/Maintenance Products: Granular Detergent -Compact (small scale)
COLIPA 4, 7 and 9 - Formulation of Cosmetics: Fine Fragrances - Cleaning with Water (medium scale), Medium Viscosity Body Care Products (small scale), Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (medium scale)
COLIPA 5 - Formulation of Cosmetics: Fine Fragrances - Cleaning with Water (small scale)
COLIPA 10 - Formulation of Cosmetics: Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (small scale)
CEPE 7 - Formulation of Powder Coatings and Inks – Solids
CEPE 8, 9 - Formulation of Liquid Coatings and Inks - Large Scale and Small Scale
ESVOC 4 - Formulation of solvents and solvent based products
FEICA 2,3 - Formulation of Solvent Borne adhesives - Volatiles (Large Scale and Small Scale)
EFCC2 - Formulation of Construction Chemicals - Use of Volatile substances (additives)

Environment	
Formulation of preparations	ERC 2
Worker	
Formulation in closed process, no likelihood of exposure – liquid	PROC 1
Formulation in closed process, no likelihood of exposure – solid	PROC 1
Formulation in closed, continuous process with occasional controlled exposure – liquid	PROC 2
Formulation in closed, continuous process with occasional controlled exposure – solid	PROC 2
Formulation in closed batch process (synthesis or formulation) – liquid	PROC 3
Formulation in closed batch process (synthesis or formulation) – solid	PROC 3
Formulation in batch and other process (synthesis) where opportunity for exposure arises - liquid	PROC 4
Formulation in batch and other process (synthesis) where opportunity for exposure arises – solid	PROC 4
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) - liquid	PROC 5
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) – solid	PROC 5
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - liquid	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities – solid	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - liquid	PROC 8b
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - solid	PROC 8b
Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - liquid	PROC 9
Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - solid	PROC 9
Roller application or brushing – liquid	PROC 10
Treatment of articles by dipping and pouring – liquid	PROC 13
Formulation of preparations or articles by tabletting, compression, extrusion, pelletisation – solid	PROC 14
Use as laboratory reagent – liquid	PROC 15
Use as laboratory reagent – solid	PROC 15

2. CONDITION OF USE AFFETTING EXPOSURE	
2.1 Control of environmental exposure	
2.1.1 **AISE 1, 5 and 7- Formulation of Detergents/Maintenance Products: Granular Detergent - Regular (large scale), Granular Detergent -Compact (small scale), Low Viscosity Liquids (large scale)**	
Municipal sewage treatment plant	Yes [Water: 91.5%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.2 **AISE 2, 8 and 10 and COLIPA 1, 14 and 15 - Formulation of Detergents/Maintenance Products: Granular Detergent -Regular (medium scale), Low Viscosity Liquids (medium scale), High Viscosity Liquids (large scale); Formulation of Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (large scale), body care soap (medium and large scale)**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.3 **AISE 3, 9 and 11 and COLIPA 2 and 16 - Formulation of Detergents/Maintenance Products: Granular Detergent - Regular (small scale), Low Viscosity Liquids (small scale), High Viscosity Liquids (medium scale); Formulation Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (medium scale), body care soap (small scale)**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.4 **AISE 12 and COLIPA 3 - Formulation of Detergents/Maintenance Products: High Viscosity Liquids (small scale) Formulation of Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (small scale)**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.5 **COLIPA 6 and 8 - Formulation of Cosmetics: Medium Viscosity Body Care Products (medium scale), Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (large scale)**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.6 **AISE 4 - Formulation of Detergents/Maintenance Products: Granular Detergent -Compact (large scale)**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes

2.1.7 **AISE 6 - Formulation of Detergents/Maintenance Products: Granular Detergent -Compact (small scale)**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.8 **COLIPA 4, 7 and 9 - Formulation of Cosmetics: Fine Fragrances - Cleaning with Water (medium scale), Medium Viscosity Body Care Products (small scale), Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (medium scale)**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.9 **COLIPA 5 - Formulation of Cosmetics: Fine Fragrances - Cleaning with Water (small scale)**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.10 **COLIPA 10 - Formulation of Cosmetics: Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (small scale)**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.11 **CEPE 7 - Formulation of Powder Coatings and Inks – Solids**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.12 **CEPE 8, 9 - Formulation of Liquid Coatings and Inks - Large Scale and Small Scale**	
Municipal sewage treatment plant	Yes [Water: 100%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.13 **ESVOC 4 - Formulation of solvents and solvent based products**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes

2.1.14 **FEICA 2,3 - Formulation of Solvent Borne adhesives - Volatiles (Large Scale and Small Scale)**	
Municipal sewage treatment plant	Yes [Water: 100%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.15 **EFCC2 - Formulation of Construction Chemicals - Use of Volatile substances (additives)**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes

2.2 Control of workers exposure				
PROC 1: Formulation in closed process, no likelihood of exposure - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 1: Formulation in closed process, no likelihood of exposure - SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance product type: Powders, granules or pelletised material	Dustiness: Coarse dust	Activity class: movement and agitation of powders, granules or pelletized material	Situation: movement and agitation of 100 – 1000 kg	Containment level: open process
Surface of skin exposed: one hand face only (240 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 2: "Formulation in closed, continuous process with occasional controlled exposure - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min Operation carried out for 30 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids (450 min.) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Substance type: Liquids (30 min.) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: transfer of liquid product with flow of 0.-1 l/min.	Containment level: Handling that reduces contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls.
Surface of skin exposed: two hands face (480 cm 2) No restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 2: "Formulation in closed, continuous process with occasional controlled exposure - SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min Operation carried out for 30 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material (450 min.)	Dustiness: Coarse dust	Activity class: movement and agitation of powders, granules or pelletized material	Situation: movement and agitation of 100 – 1000 kg	Containment level: open process
Substance product: Powders, granules or pelletised material (30 min.)	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 0.1 – 1 kg/minute	Containment level: Handling that reduces contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls (see next questions).
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 3: "Formulation in closed batch process (synthesis or formulation) – LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min (near field) Operation carried out for 30 min (near field)				
Other operational conditions affecting workers exposure				
Substance type: Liquids (450 min.) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Substance type: Liquids (30 min.) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: transfer of liquid product with flow of 0.-1 l/min.	Containment level: open process
Surface of skin exposed: one hand face only (240 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 3: "Formulation in closed batch process (synthesis or formulation) – SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min (near field) Operation carried out for 30 min (near field)				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material (450 min.)	Dustiness: Coarse dust	Activity class: movement and agitation of powders, granules or pelletized material	Situation: movement and agitation of 100 – 1000 kg	Containment level: open process
Substance product: Powders, granules or pelletised material (30 min.)	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 0.1 – 1 kg/minute	Containment level: open process
Surface of skin exposed: one hand face only (240 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Medium level of containment [Inhalation: 99%] (for operation carried out for 450 min) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 4: Formulation in batch and other process (synthesis) where opportunity for exposure arises LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Surface of skin exposed: one hand face only (240 cm 2) No restriction on general ventilation Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 4: Formulation in batch and other process (synthesis) where opportunity for exposure arises LIQUID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min Operation carried out for 30 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material (450 min.)	Dustiness: Coarse dust	Activity class: movement and agitation of powders, granules or pelletized material	Situation: movement and agitation of 100 – 1000 kg	Containment level: open process
Substance product: Powders, granules or pelletised material (30 min.)	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 0.1 – 1 kg/minute	Containment level: open process
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level of containment [Inhalation: 90%] (for operation carried out for 450 min) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 5: "Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 5: "Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) - SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min Operation carried out for 30 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material	Dustiness: Coarse dust	Activity class: movement and agitation of powders, granules or pelletized material	Situation: movement and agitation of 100 – 1000 kg	Containment level: open process
Substance product: Powders, granules or pelletised material	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 10 – 100 gram/minute	Containment level: open process
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) (for) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: transfer of liquid product with flow of 100 – 1000 l/minute	Containment level: Handling that reduces product with flow contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands (960 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 10 – 100 gram/minute	Containment level: open process
Surface of skin exposed: two hands (960 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 8b: "Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: transfer of liquid product with flow of 100 – 1000 l/minute	Containment level: Handling that reduces product with flow contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities – SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 100 – 1000 kg/minute	Containment level: Handling that reduces product with flow contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				

Condition and measures related to personal protection, hygiene and health evaluation
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.

PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: transfer of liquid product with flow of 10 – 100 l/minute	Containment level: Handling that reduces product with flow contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 100 – 1000 kg/minute	Containment level: Handling that reduces product with flow contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				

Condition and measures related to personal protection, hygiene and health evaluation
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.

PROC 10: Roller application or brushing – LIQUID				
Product characteristics				
Concentration of the substance: - 5 to 50% - 1 to 5%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 240 min for concentration up to 50% Operation carried out for 240 min for concentration up to 50% Operation carried out for 240 min for concentration up to 5% Operation carried out for 240 min for concentration up to 5%				
Other operational conditions affecting workers exposure				
concentration of the substance: 5 to 50%				
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: spreading of liquid products	Situation: spreading of liquids at surfaces or work pieces 0.3 – 1.0 m2/hour	Containment level: n. a.
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: handling of contaminated products	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % or surface
Surface of skin exposed: two hands (960 cm 2) Ventilation rate: 3 air changes per hour Indoor use assumed				
concentration of the substance: 5 to 50%				
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: spreading of liquid products	Situation: spreading of liquids at surfaces or work pieces 0.3 – 1.0 m2/hour	Containment level: n. a.
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: handling of contaminated products	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % or surface
Surface of skin exposed: two hands (960 cm 2) Ventilation rate: 3 air changes per hour Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) (for) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 13: Roller application or brushing – LIQUID				
Product characteristics				
Concentration of the substance: - 25 to 50% - 5 to 25% - 1 to 5%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 240 min for concentration up to 50% Operation carried out for 240 min for concentration up to 50% Operation carried out for 240 min for concentration up to 25% Operation carried out for 240 min for concentration up to 25% Operation carried out for 230 min for concentration up to 5% Operation carried out for 230 min for concentration up to 5% Operation carried out for 20 min for concentration up to 5%				
Other operational conditions affecting workers exposure				
concentration of the substance: 5 to 50%				
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with relatively undisturbed surfaces (no aerosol formation)	Situation: open surface 1 – 3 m2	Containment level: LEV fixed capturing hood (50 % reduction)
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: handling of contaminated products	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % or surface
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: 3 air changes per hour Indoor use assumed				
concentration of the substance: 5 to 25%				
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with relatively undisturbed surfaces (no aerosol formation)	Situation: open surface 1 – 3 m2	Containment level: n. a.
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: handling of contaminated products	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % or surface
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: 3 air changes per hour Indoor use assumed				

concentration of the substance: 1 to 5%				
Substance type: Liquids (20 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with relatively undisturbed surfaces (no aerosol formation)	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: n. a.
Substance type: Liquids (230 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with relatively undisturbed surfaces (no aerosol formation)	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % of surface
Substance type: Liquids (230 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: Falling liquids	Situation: Transfer of liquid product with flow of 0.1 – 1 l/minute	Containment level: open process
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) (for) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 14: Formulation of preparations or articles by 28 ableting, compression, extrusion, pelletisation - SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material	Dustiness: Granules, flakes or pellets	Activity class: compressing of powders, granules or pelletised material	Situation: Compressing 100 – 1000 kg/minute	Containment level: open process
Surface of skin exposed: two hands (960 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 15: use as laboratory reagent – LIQUID				
Product characteristics				
Concentration of the substance: - 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min.				
Other operational conditions affecting workers exposure				
Substance type: Liquids (30 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: Falling liquids	Situation: Transfer of liquid product with flow of 0.1 – 1 l/minute	Containment level: open process
Substance type: Liquids (30 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: Falling liquids	Situation: Transfer of liquid product with flow of < 0.1 l/minute	Containment level : handling that reduces contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Substance type: Liquids (420 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with relatively undisturbed surfaces (no aerosol formation)	Situation: Open surface < 0.1 m2	Containment level: n. a.
Surface of skin exposed: one hand face only (240 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) (for) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 15: use as laboratory reagent – SOLID				
Product characteristics				
Concentration of the substance: - 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min.				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules pelletised material (30 min)	Dustiness: coarse dust	Activity class: Falling powders	Situation: Transferring 10 – 100 gram/minute	Containment level: open process
Substance product: Powders, granules pelletised material (30 min)	Dustiness: coarse dust	Activity class: Falling powders	Situation: Transferring less than 10 gram/minute	Containment level: open process
Substance product: Powders, granules pelletised material (420 min)	Dustiness: coarse dust	Activity class: movement and agitation of powders, granules or pelletised material	Situation: movement and agitation of < 10 gram	Containment level: open process
Surface of skin exposed: one hand face only (240 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) (for) Substance/task appropriate respirator; Optional face shield; Eye protection.				

3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE		
3.1 AISE 1, 5 and 7 – Formulation of Detergents/Maintenance Products: Granular Detergent – Regular (large scale), Granular Detergent –Compact (small scale), Low Viscosity Liquids (large scale)		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.264	**SPERC**
Air	2.528	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.96 mg/kg ww	**0.072**
Marine Water Food Chain (Predators)	Local PEC: 0.089 mg/kg ww	**0.007**
Marine Water Food Chain (Top Predators)	Local PEC: 0.045 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 9.68E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.2 AISE 2, 8 and 10 and COLIPA 1, 14 and 15 – Formulation of Detergents/Maintenance Products: Granular Detergent –Regular (medium scale), Low Viscosity Liquids (medium scale), High Viscosity Liquids (large scale); Formulation of Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (large scale), body care soap (medium and large scale)		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.264	**SPERC**
Air	0.253	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.96 mg/kg ww	**0.072**
Marine Water Food Chain (Predators)	Local PEC: 0.089 mg/kg ww	**0.007**
Marine Water Food Chain (Top Predators)	Local PEC: 0.045 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 6.41E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.3 AISE 3, 9 and 11 and COLIPA 2 and 16 – Formulation of Detergents/Maintenance Products: Granular Detergent –Regular (small scale), Low Viscosity Liquids (small scale), High Viscosity Liquids (medium scale); Formulation Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (medium scale), body care soap (small scale)		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.264	**SPERC**
Air	0.126	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.96 mg/kg ww	**0.072**
Marine Water Food Chain (Predators)	Local PEC: 0.089 mg/kg ww	**0.007**
Marine Water Food Chain (Top Predators)	Local PEC: 0.045 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 6.41E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.4 AISE 12 and COLIPA 3 – Formulation of Detergents/Maintenance Products: High Viscosity Liquids (small scale) Formulation of Cosmetics: low viscosity liquids (Shampoo, hair conditioner, shower gel, foam bath) (small scale)		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.264	**SPERC**
Air	0	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.96 mg/kg ww	**0.072**
Marine Water Food Chain (Predators)	Local PEC: 0.089 mg/kg ww	**0.007**
Marine Water Food Chain (Top Predators)	Local PEC: 0.045 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 6.41E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.5 Formulation COLIPA 6 and 8 – Formulation of Cosmetics: Medium Viscosity Body Care Products (medium scale), Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (large scale))		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.264	**SPERC**
Air	0	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.96 mg/kg ww	**0.072**
Marine Water Food Chain (Predators)	Local PEC: 0.089 mg/kg ww	**0.007**
Marine Water Food Chain (Top Predators)	Local PEC: 0.045 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 6.41E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.6 AISE 4 – Formulation of Detergents/Maintenance Products: Granular Detergent –Compact (large scale)		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.264	**SPERC**
Air	25.28	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.96 mg/kg ww	**0.072**
Marine Water Food Chain (Predators)	Local PEC: 0.089 mg/kg ww	**0.007**
Marine Water Food Chain (Top Predators)	Local PEC: 0.045 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 0.005 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.175 mg/kg ww	**0.013**

3.7 AISE 6 – Formulation of Detergents/Maintenance Products: Granular Detergent –Compact (small scale))		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.264	**SPERC**
Air	1.264	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.96 mg/kg ww	**0.072**
Marine Water Food Chain (Predators)	Local PEC: 0.089 mg/kg ww	**0.007**
Marine Water Food Chain (Top Predators)	Local PEC: 0.045 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 7.56E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.8 COLIPA 4, 7 and 9 – Formulation of Cosmetics: Fine Fragrances – Cleaning with Water (medium scale), Medium Viscosity Body Care Products (small scale), Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (medium scale)		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.264	**SPERC**
Air	0	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.96 mg/kg ww	**0.072**
Marine Water Food Chain (Predators)	Local PEC: 0.089 mg/kg ww	**0.007**
Marine Water Food Chain (Top Predators)	Local PEC: 0.045 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 6.41E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.9 COLIPA 5 – Formulation of Cosmetics: Fine fragrances – Cleaning with Water (small scale)		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.263	**SPERC**
Air	0	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.96 mg/kg ww	**0.072**
Marine Water Food Chain (Predators)	Local PEC: 0.089 mg/kg ww	**0.007**
Marine Water Food Chain (Top Predators)	Local PEC: 0.045 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 6.41E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.10 COLIPA 10 – Formulation of Non-liquid Creams (skin care, body care, mascara, solar oil, make-up foundation) (small scale)		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.263	**SPERC**
Air	0	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.462 mg/kg ww	**0.035**
Marine Water Food Chain (Predators)	Local PEC: 0.089 mg/kg ww	**0.003**
Marine Water Food Chain (Top Predators)	Local PEC: 0.035 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 5.54E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.11 CEPE 7 – Formulation of Powder Coatings and Inks – Solids		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.265	**SPERC**
Air	1.265	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.609**
Fresh Water (Sediment)	Local PEC: 0.805 mg/kg dw	**0.619**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.599**
Fresh Water Food Chain (Predators)	Local PEC: 0.973 mg/kg ww	**0.073**
Marine Water Food Chain (Predators)	Local PEC: 0.09 mg/kg ww	**0.007**
Marine Water Food Chain (Top Predators)	Local PEC: 0.045 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 6.43E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.12 CEPE 8, 9 – Formulation of Liquid Coatings and Inks – Large Scale and Small Scale		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	0	**SPERC**
Air	7.333	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 5.96E-4 mg/L Local concentration: 0	**0.11**
Fresh Water (Sediment)	Local PEC: 0.146 mg/kg dw	**0.112**
Marine Water (Pelagic)	Local PEC: 4.91E-5 mg/L Local concentration: 0	**0.091**
Marine Water (Sediment)	Local PEC: 0.012 mg/kg dw	**0.092**
Fresh Water Food Chain (Predators)	Local PEC: 0.407 mg/kg ww	**0.031**
Marine Water Food Chain (Predators)	Local PEC: 0.09 mg/kg ww	**0.003**
Marine Water Food Chain (Top Predators)	Local PEC: 0.034 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0	**0**
Air	Local PEC: 0.002 mg/m3	**not required**
Agricultural Soil	Local PEC: 1.6E-4 mg/kg dw Local concentration: 1.16E-4 mg/kg dw	**6.13E-4**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.003 mg/kg ww	**2.331E-4**

3.13 ESVOC 4 – Formulation of solvents and solvent based products		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.26	**SPERC – ESVOC 4**
Air	63	**SPERC – ESVOC 4**
Soil	0	**SPERC – ESVOC 4**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.606**
Fresh Water (Sediment)	Local PEC: 0.146 mg/kg dw	**0.617**
Marine Water (Pelagic)	Local PEC: 3.17E-4 mg/L Local concentration: 2.68E-4 mg/L	**0.587**
Marine Water (Sediment)	Local PEC: 0.012 mg/kg dw	**0.597**
Fresh Water Food Chain (Predators)	Local PEC: 0.078 mg/kg dw	**0.087**
Marine Water Food Chain (Predators)	Local PEC: 1.16 mg/kg ww	**0.008**
Marine Water Food Chain (Top Predators)	Local PEC: 0.049 mg/kg ww	**0.004**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**0.013**
Air	Local PEC: 0.015 mg/m3	**not required**
Agricultural Soil	Local PEC: 1.6E-4 mg/kg dw Local concentration: 1.16E-4 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.177 mg/kg ww	**0.013**

3.14 FEICA 2,3 – Formulation of Solvent Borne adhesives – Volatiles (Large Scale and Small Scale)		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.26	**SPERC – ESVOC 4**
Air	63	**SPERC – ESVOC 4**
Soil	0	**SPERC – ESVOC 4**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.11**
Fresh Water (Sediment)	Local PEC: 0.146 mg/kg dw	**0.112**
Marine Water (Pelagic)	Local PEC: 3.17E-4 mg/L Local concentration: 2.68E-4 mg/L	**0.091**
Marine Water (Sediment)	Local PEC: 0.012 mg/kg dw	**0.092**
Fresh Water Food Chain (Predators)	Local PEC: 0.078 mg/kg dw	**0.031**
Marine Water Food Chain (Predators)	Local PEC: 1.16 mg/kg ww	**0.003**
Marine Water Food Chain (Top Predators)	Local PEC: 0.049 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**0**
Air	Local PEC: 0.015 mg/m3	**0**
Agricultural Soil	Local PEC: 1.6E-4 mg/kg dw Local concentration: 1.16E-4 mg/kg dw	**0.014**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.177 mg/kg ww	**9.248E-4**

3.15 EFCC2 – Formulation of Construction Chemicals – Use of Volatile substances (additives)		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.26	**SPERC – ESVOC 4**
Air	2.53	**SPERC – ESVOC 4**
Soil	0	**SPERC – ESVOC 4**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.609**
Fresh Water (Sediment)	Local PEC: 0.146 mg/kg dw	**0.619**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.599**
Fresh Water Food Chain (Predators)	Local PEC: 0.961 mg/kg ww	**0.072**
Marine Water Food Chain (Predators)	Local PEC: 0.089 mg/kg ww	**0.007**
Marine Water Food Chain (Top Predators)	Local PEC: 0.045 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**0.013**
Air	Local PEC: 9.68E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

Workers					
Contributing scenario	**Inhalation Long-term, systemic**	**Dermal Long-term, systemic**	**Dermal Acute local**	**Combined Routes (RCR)**	**Exposure estimation Method**
PROC 1 LIQUID	Exposure: 0.44 mg/m3 RCR = 0.001	Exposure: 0.003 mg/kg bw/day RCR = 7.713E-5	Exposure: 0.002 mg/cm2 RCR = 0.002	0.001	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 1 SOLID	Exposure: 0.032 mg/m3 RCR = 0.001	Exposure: 6.857E-4 mg/kg bw/day RCR = 7.713E-5	Exposure: 3.99E-4 mg/cm2 RCR = 0.002	0.001	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 2 LIQUID	Exposure: 0.69 mg/m3 RCR = 0.022	Exposure: 0.014 mg/kg bw/day RCR = 0.002	Exposure: 0.004 mg/cm2 RCR = 0.022	0.024	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 2 SOLID	Exposure: 0.036 mg/m3 RCR = 0.001	Exposure: 0.003 mg/kg bw/day RCR = 3.085E-4	Exposure: 8.75E-4 mg/cm RCR = 0.005	0.001	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 3 LIQUID	Exposure: 4.3 mg/m3 RCR = 0.138	Exposure: 0.003 mg/kg bw/day RCR = 3.857E-4	Exposure: 0.002 mg/cm2 RCR = 0.011	0.138	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 3 SOLID	Exposure: 0.032 mg/m3 RCR = 0.01	Exposure: 6.857E-4 mg/kg bw/day RCR = 7.713E-5	Exposure: 3.99E-4 mg/cm2 RCR = 0.002	0.010	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure

PROC 4 LIQUID	Exposure: 4.4 mg/m3 RCR = 0.142	Exposure: 0.069 mg/kg bw/day RCR = 0.008	Exposure: 0.02 mg/cm2 RCR = 0.108	0.15	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 4 SOLID	Exposure: 3 mg/m3 RCR = 0.096	Exposure: 0.014 mg/kg bw/day RCR = 0.002	Exposure: 0.004 mg/cm2 RCR = 0.022	0.098	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 5 LIQUID	Exposure: 4.4 mg/m3 RCR = 0.142	Exposure: 0.137 mg/kg bw/day RCR = 0.015	Exposure: 0.04 mg/cm2 RCR = 0.215	0.157	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 5 SOLID	Exposure: 3 mg/m3 RCR = 0.096	Exposure: 0.027 mg/kg bw/day RCR = 0.003	Exposure: 0.008 mg/cm2 RCR = 0.043	0.098	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 8a LIQUID	Exposure: 13 mg/m3 RCR = 0.096	Exposure: 0.137 mg/kg bw/day RCR = 0.003	Exposure: 0.04 mg/cm2 RCR = 0.043	0.099	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 8a SOLID	Exposure: 3.2 mg/m3 RCR = 0.103	Exposure: 0.027 mg/kg bw/day RCR = 0.003	Exposure: 0.004 mg/cm2 RCR = 0.022	0.106	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure

PROC 8b LIQUID	Exposure: 13 mg/m3 RCR = 0.418	Exposure: 0.069 mg/kg bw/day RCR = 0.008	Exposure: 0.02 mg/cm2 RCR = 0.108	0.426	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 8b SOLID	Exposure: 3.2 mg/m3 RCR = 0.103	Exposure: 0.014 mg/kg bw/day RCR = 0.002	Exposure: 0.004 mg/cm2 RCR = 0.022	0.105	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 9 LIQUID	Exposure: 13 mg/m3 RCR = 0.418	Exposure: 0.069 mg/kg bw/day RCR = 0.008	Exposure: 0.02 mg/cm2 RCR = 0.108	0.426	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 9 SOLID	Exposure: 0.96 mg/m3 RCR = 0.031	Exposure: 0.014 mg/kg bw/day RCR = 0.002	Exposure: 0.004 mg/cm2 RCR = 0.022	0.033	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 10 LIQUID	Exposure: 16 mg/m 3 (c up to 50%). 4 mg/m3 (c up to 5%). RCR = 0.515 (concentration up to 50%). RCR = 0.129 (concentration up to 5%).	Exposure: 0.274 mg/kg bw/day RCR = 0.108	Exposure: 0.04 mg/cm2 RCR = 0.031	0.546 (concentration up to 50%). 0.16 (concentration up to 5%).	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure

PROC 13 LIQUID	Exposure: 12 mg/m 3 (c up to 50%). 16 mg/m3 (c up to 25%). 2.2 mg/m3 (c up to 5%). RCR = 0.386 (concentration up to 50%). RCR = 0.45 (concentration up to 25%). RCR = 0.071 (concentration up to 5%).	Exposure: 0.137 mg/kg bw/day RCR = 0.108	Exposure: 0.04 mg/cm2 RCR = 0.015	0.546 (concentration up to 50%). 0.16 (concentration up to 25%). 0.086 (concentration up to 5%).	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 14 SOLID	Exposure: 0.32 mg/m3 RCR = 0.01	Exposure: 0.007 mg/kg bw/day RCR = 7.713E-4	Exposure: 0.002 mg/cm2 RCR = 0.011	0.011	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 15 LIQUID	Exposure: 4.2 mg/m3 RCR = 0.135	Exposure: 0.003 mg/kg bw/day RCR = 3.857E-4	Exposure: 0.002 mg/cm2 RCR = 0.022	0.135	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 15 SOLID	Exposure: 0.092 mg/m3 RCR = 0.003	Exposure: 6.857E-4 mg/kg bw/day RCR = 7.713E-5	Exposure: 3.99E-4 mg/cm 2 RCR = 0.002	0.003	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure

4. SCALING FOR DOWNSTREAM USER

In order to adapt the operating conditions and the measurements of the risk management to the single corporate reality (scaling), downstream users may use the same calculation model used in the preparation of the data presented
EUSES 2.0 was used for estimation of environmental exposure
Advanced REACH tool (www.advancedreachtool.com) was used for estimation of workers exposure.

The determination of the levels of oil of sweet orange campaigns by environmental monitoring (environmental sampling at fixed locations and / or personal sampling) is a different approach to assess whether the downstream work within the limits set by the exposure scenario. Therefore the detection of concentrations below the DNEL documenting that the use of the substance takes place in conditions of safety (controlled risk).

1. TITLE OF EXPOSURE SCENARIO
Industrial use of fragranced products CEPE 15, 16a - Other spray coating - Volatiles / Abatement including indoor point sources CEPE 17a - Other spray coating, indoor use - point sources – Solids ESVOC 11 - Industrial use of solvents in oil field drilling and production operations ESVOC 13 - Industrial use of formulated lubricants ESVOC 38 - Use of the substance within laboratory setting, including pilot plants FEICA 6,7 - Industrial Use of Substances other than Solvents in Paper, Board and related Products/ Woodworking and joinery/Footwear and Leather/Textile/Transportation (Automotive/aircraft/rail vehicles) /Industrial Building Construction/Adhesives/Others FEICA 8,9 - Industrial Use of Solvents in Paper, Board and related Products/ Woodworking and joinery/Footwear and Leather/Textile/Transportation (Automotive/aircraft/rail vehicles) /Industrial Building Construction Adhesives/Others adhesives

Environment	
Industrial use of processing aids in processes and products, not becoming part of articles	ERC 4
Industrial use resulting in inclusion into or onto a matrix	ERC 5
Worker	
Use in closed process, no likelihood of exposure – liquid	PROC 1
Use in closed process, no likelihood of exposure – solid	PROC 1
Use in closed, continuous process with occasional controlled exposure – liquid	PROC 2
Use in closed, continuous process with occasional controlled exposure – solid	PROC 2
Use in closed batch process – liquid	PROC 3
Use in closed batch process – solid	PROC 3
Use in batch and other process where opportunity for exposure arises - liquid	PROC 4
Use in batch and other process where opportunity for exposure arises – solid	PROC 4
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) - liquid	PROC 5
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) – solid	PROC 5
Industrial and non-industrial spraying – liquid	PROC 7 and 11
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - liquid	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities – solid	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - liquid	PROC 8b
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - solid	PROC 8b
Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - liquid	PROC 9
Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - solid	PROC 9
Roller application or brushing – liquid	PROC 10
Treatment of articles by dipping and pouring – liquid	PROC 13
Production of preparations or articles by tabletting, compression, extrusion, pelletisation – solid	PROC 14
Use as laboratory reagent – liquid	PROC 15
Use as laboratory reagent – solid	PROC 15
Hand-mixing with intimate contact and only PPE available – liquid	PROC 19

2. CONDITION OF USE AFFETTING EXPOSURE	
2.1 Control of environmental exposure	
2.1.1 **CEPE 15, 16a - Other spray coating - Volatiles / Abatement including indoor point sources**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.2 **CEPE 17a - Other spray coating, indoor use - point sources – Solids**	
Municipal sewage treatment plant	Yes [Water: 100%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.3 **ESVOC 11 - Industrial use in oil field drilling and production operations**	
Municipal sewage treatment plant	Yes
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.4 **ESVOC 13 - Industrial use of formulated lubricants**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.5 **ESVOC 38 - Use of the substance within laboratory setting, including pilot plants**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.6 **FEICA 6,7 - Industrial Use of Substances other than Solvents in Paper, Board and related Products/ Woodworking and joinery/Footwear and Leather/Textile/Transportation (Automotive/aircraft/rail vehicles) /Industrial Building Construction Adhesives/Others**	
Municipal sewage treatment plant	Yes [Water: 100%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes

2.1.7 **FEICA 8,9 - Industrial Use of Solvents in Paper, Board and related Products/ Woodworking and joinery/Footwear and Leather/Textile/Transportation (Automotive/aircraft/rail vehicles) /Industrial Building Construction Adhesives/Others adhesives**	
Municipal sewage treatment plant	Yes [Water: 100%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes

2.2 Control of workers exposure				
PROC 1: Formulation in closed process, no likelihood of exposure - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 1: Formulation in closed process, no likelihood of exposure - SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance product type: Powders, granules or pelletised material	Dustiness: Coarse dust	Activity class: movement and agitation of powders, granules or pelletized material	Situation: movement and agitation of 100 – 1000 kg	Containment level: open process
Surface of skin exposed: one hand face only (240 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 2: Use in closed, continuous process with occasional controlled exposure - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min Operation carried out for 30 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids (450 min.) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Substance type: Liquids (30 min.) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: transfer of liquid product with flow of 0.-1 l/min.	Containment level: open process
Surface of skin exposed: two hands face (480 cm 2) No restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 2: Use in closed, continuous process with occasional controlled exposure – SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min Operation carried out for 30 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material (450 min.)	Dustiness: Coarse dust	Activity class: movement and agitation of powders, granules or pelletized material	Situation: movement and agitation of 100 – 1000 kg	Containment level: open process
Substance product: Powders, granules or pelletised material (30 min.)	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 0.1 – 1 kg/minute	Containment level: Handling that reduces contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls (see next questions).
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 3: Use in closed batch process (synthesis or formulation) – LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min (near field) Operation carried out for 30 min (near field)				
Other operational conditions affecting workers exposure				
Substance type: Liquids (450 min.) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Substance type: Liquids (30 min.) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: transfer of liquid product with flow of 0.-1 l/min.	Containment level: open process
Surface of skin exposed: one hand face only (240 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 3: Use in closed batch process (synthesis or formulation) – SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min (near field) Operation carried out for 30 min (near field)				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material (450 min.)	Dustiness: Coarse dust	Activity class: movement and agitation of powders, granules or pelletized material	Situation: movement and agitation of 100 – 1000 kg	Containment level: open process
Substance product: Powders, granules or pelletised material (30 min.)	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 0.1 – 1 kg/minute	Containment level: open process
Surface of skin exposed: one hand face only (240 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Medium level of containment [Inhalation: 99%] (for operation carried out for 450 min) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 4: "Use in batch and other process where opportunity for exposure arises - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: n. a.
Surface of skin exposed: one hand face only (240 cm 2) No restriction on general ventilation Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; High level of containment [Inhalation: 100%] Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 4: "Use in batch and other process where opportunity for exposure arises - SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min Operation carried out for 30 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material (450 min.)	Dustiness: Coarse dust	Activity class: movement and agitation of powders, granules or pelletized material	Situation: movement and agitation of 100 – 1000 kg	Containment level: open process
Substance product: Powders, granules or pelletised material (30 min.)	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 10 – 100 gram/minute	Containment level: open process
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level of containment [Inhalation: 90%] (for operation carried out for 450 min) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with agitated surfaces	Situation: open surface 1 - 3 m2	Containment level: open process
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) - SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 450 min Operation carried out for 30 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material	Dustiness: Coarse dust	Activity class: movement and agitation of powders, granules or pelletized material	Situation: movement and agitation of 100 – 1000 kg	Containment level: open process
Substance product: Powders, granules or pelletised material	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 10 – 100 gram/minute	Containment level: open process
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) (for) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 7: Industrial and non-industrial spraying - LIQUID				
Product characteristics				
Concentration of the substance: - 10 to 50% (1-5% in PROC 11.) - 1 to 5% - 5 to 10% (dissolved solid; PROC 7) - 5 to 10% (PROC 11) - 5 to 25%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 240 min (Concentration up to 50% PROC 7) Operation carried out for 240 min (Concentration up to 50% PROC 7) Operation carried out for 225 min (Concentration up to 10% PROC 7) Operation carried out for 225 min (Concentration up to 10% PROC 7) Operation carried out for 30 min (Concentration up to 10% PROC 7) Operation carried out for 240 min (Concentration up to 5% PROC 7) Operation carried out for 240 min (Concentration up to 5% PROC 7) Operation carried out for 240 min (Concentration up to 50% PROC 11) Operation carried out for 240 min (Concentration up to 50% PROC 11) Operation carried out for 480 min (Concentration up to 25% PROC 11- outdoors) Operation carried out for 480 min (Concentration up to 5% PROC 11 - outdoor)				
Other operational conditions affecting workers exposure				
Concentration up to 50% (PROC 7)				
Substance product: liquid (225 min) Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: Surface spraying of liquids	Situation: moderate application rate (0.3 - 3 l/minute)	Spray direction and technique: only horizontal or downward; Spraying with no or low compressed air use
Substance product: liquid (225 min) Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: handling of contaminated objects	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % of surface
Concentration up to 10% (PROC 7)				
Substance product: liquid (225 min) Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: Surface spraying of liquids	Situation: moderate application rate (0.3 - 3 l/minute)	Spray direction and technique: only horizontal or downward; Spraying with no or low compressed air use
Substance product: liquid (225 min) Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: handling of contaminated objects	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % of surface

Substance type: powders, granules or pelletised material (30 min)	Dustiness: coarse dust	Activity class: falling powders	Situation: transferring 10 – 100 gram/min	Containment level: open process
Concentration up to 10% (PROC 7)				
Substance product: liquid (240 min) Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: Surface spraying of liquids	Situation: moderate application rate (0.3 - 3 l/minute)	Spray direction and technique: only horizontal or downward; Spraying with no or low compressed air use
Substance product: liquid (240 min) Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: handling of contaminated objects	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % of surface
Concentration up to 5% (PROC 7)				
Substance product: liquid (240 min) Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: Surface spraying of liquids	Situation: moderate application rate (0.3 - 3 l/minute)	Spray direction and technique: only horizontal or downward; Spraying with no or low compressed air use
Substance product: liquid (240 min) Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: handling of contaminated objects	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % of surface
Concentration up to 50% (PROC 11)				
Substance product: liquid (240 min) Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: Surface spraying of liquids	Situation: moderate application rate (0.3 - 3 l/minute)	Spray direction and technique: only horizontal or downward; Spraying with no or low compressed air use
Substance product: liquid (240 min) Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: handling of contaminated objects	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % of surface

Concentration up to 10% (PROC 11)				
Substance product: liquid (240 min) Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: Surface spraying of liquids	Situation: moderate application rate (0.3 - 3 l/minute)	Spray direction and technique: only horizontal or downward; Spraying with no or low compressed air use
Substance product: liquid (240 min) Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: handling of contaminated objects	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % of surface
Concentration up to 25% (PROC 11) - outdoor				
Substance product: liquid Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: Surface spraying of liquids	Situation: moderate application rate (0.03 – 0.03 l/minute)	Spray direction and technique: In any direction (including upwards); spraying with no or low compressed air use
Concentration up to 5% (PROC 11) - outdoor				
Substance product: liquid Vapour pressure: 186.4 Pa	Process temperature: room temperature	Activity class: Surface spraying of liquids	Situation: moderate application rate (0.03 – 0.03 l/minute)	Spray direction and technique: In any direction (including upwards); spraying with no or low compressed air use
Surface of skin exposed: two hands and upper wrists (1500 cm 2) Pressure used in process: high (concentration of 1-5% in PROC 11) Pressure used in process: medium (concentration of 5-25% in PROC 11) Outdoors use assumed (concentrations 5-25% and 1-5% in PROC 11) Presence of natural ventilation is required (concentration of 5-10% in PROC 11) 3ACH (concentration of 10-50% in PROC 11) Fixed capturing hood and other LEV systems (PROC 7; concentration of 1-5% in PROC 11) Horizontal/downward laminar flow booth (PROC 7; concentrations 5-25% and 1-5% in PROC 11)				

Condition and measures related to personal protection, hygiene and health evaluation
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.

PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: transfer of liquid product with flow of 100 – 1000 l/minute	Containment level: Handling that reduces product with flow contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands (960 cm 2) Ventilation rate: no restriction on general ventilation characteristics. Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material (450 min)	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 100 - 1000 kg/min	Handling that reduces product with flow contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands (960 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: transfer of liquid product with flow of 100 – 1000 l/minute	Containment level: Handling that reduces product with flow contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 100 – 1000 kg/minute	Containment level: Handling that reduces product with flow contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				

Condition and measures related to personal protection, hygiene and health evaluation
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.

PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) – LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: falling liquids	Situation: transfer of liquid product with flow of 10 – 100 l/minute	Containment level: Handling that reduces product with flow contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) – SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material	Dustiness: Coarse dust	Activity class: Falling powders	Situation: Transferring 10 – 100 kg/minute	Containment level: Handling that reduces product with flow contact between product and adjacent air. Note: This does not include processes that are fully contained by localized controls
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				

Condition and measures related to personal protection, hygiene and health evaluation
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.

PROC 10: Roller application or brushing – LIQUID				
Product characteristics				
Concentration of the substance: 5 to 50% Concentration of the substance: 1 to 5%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 240 min for concentration up to 50% Operation carried out for 240 min for concentration up to 50% Operation carried out for 240 min for concentration up to 5% Operation carried out for 240 min for concentration up to 5%				
Other operational conditions affecting workers exposure				
Concentration up to 50%				
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: spreading of liquid products	Situation: spreading of liquids at surfaces or work pieces 0.3 – 1.0 m2/hour	Containment level: n. a.
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: handling of contaminated products	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % or surface
Surface of skin exposed: two hands (960 cm 2) Ventilation rate: 3 air changes per hour Indoor use assumed				
Concentration up to 5%				
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: spreading of liquid products	Situation: spreading of liquids at surfaces or work pieces 0.3 – 1.0 m2/hour	Containment level: n. a.
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: handling of contaminated products	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % or surface
Surface of skin exposed: two hands (960 cm 2) Ventilation rate: 3 air changes per hour Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) (for) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 13: Roller application or brushing – LIQUID				
Product characteristics				
Concentration of the substance: 25 to 50% Concentration of the substance: 5 to 25% Concentration of the substance: 1 to 5%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 240 min (Concentration up to 50%) Operation carried out for 240 min (Concentration up to 50%) Operation carried out for 240 min (Concentration up to 25%) Operation carried out for 240 min (Concentration up to 25%) Operation carried out for 230 min (Concentration up to 5%) Operation carried out for 230 min (Concentration up to 5%) Operation carried out for 20 min (Concentration up to 5%)				
Other operational conditions affecting workers exposure				
Concentration up to 50%				
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with relatively undisturbed surfaces (no aerosol formation)	Situation: open surface 1 – 3 m2	Containment level: n. a.
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: handling of contaminated products	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % or surface
Surface of skin exposed: two hands face (480 cm 2) LEV systems (fixed capturing hood) (50 % reduction) Ventilation rate: 3 air changes per hour Indoor use assumed				
Concentration up to 25%				
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with relatively undisturbed surfaces (no aerosol formation)	Situation: open surface 1 – 3 m2	Containment level: n. a.
Substance type: Liquids (240 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: handling of contaminated products	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % or surface
Surface of skin exposed: two hands face (480 cm 2) Ventilation rate: 3 air changes per hour Indoor use assumed				

Concentration up to 5%				
Substance type: Liquids (230 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with relatively undisturbed surfaces (no aerosol formation)	Situation: open surface 1 - 3 m2	Containment level: n. a.
Substance type: Liquids (230 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: handling of contaminated objects	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % of surface
Substance type: Liquids (230 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: handling of contaminated objects	Situation: activities with treated/contaminated objects (surface 0.3-1 m2)	Containment level: contamination > 90 % of surface
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) (for) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 14: Formulation of preparations or articles by 28 ableting, compression, extrusion, pelletisation - SOLID				
Product characteristics				
Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules or pelletised material	Dustiness: Granules, flakes or pellets	Activity class: compressing of powders, granules or pelletised material	Situation: Compressing 100 – 1000 kg/minute	Containment level: open process
Surface of skin exposed: two hands (960 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 15: use as laboratory reagent – LIQUID				
Product characteristics				
Concentration of the substance: - 10 to 50%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 30 min Operation carried out for 30 min Operation carried out for 420 min				
Other operational conditions affecting workers exposure				
Substance type: Liquids (30 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: Falling liquids	Situation: Transfer of liquid product with flow of 0.1 – 1 l/minute	Containment level: open process
Substance type: Liquids (30 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: Falling liquids	Situation: transfer of liquid product with flow of 0.1 - 1 l/minute	Containment level : open process
Substance type: Liquids (420 min) Vapour pressure: 186.4 Pa	Process temperature: Room temperature	Activity class: activities with relatively undisturbed surfaces (no aerosol formation)	Situation: Open surface < 0.1 m2	Containment level: open process
Surface of skin exposed: one hand face only (240 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) (for) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 15: use as laboratory reagent – SOLID				
Product characteristics				
Concentration of the substance: - 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 30 min Operation carried out for 30 min Operation carried out for 420 min				
Other operational conditions affecting workers exposure				
Substance product: Powders, granules pelletised material	Dustiness: coarse dust	Activity class: Falling powders	Situation: Transferring 10 – 100 gram/minute	Containment level: open process
Substance product: Powders, granules pelletised material	Dustiness: coarse dust	Activity class: Falling powders	Situation: Transferring less than 10 gram/minute	Containment level: open process
Substance product: Powders, granules pelletised material	Dustiness: coarse dust	Activity class: movement and agitation of powders, granules or pelletised material	Situation: movement and agitation of < 10 gram	Containment level: open process
Surface of skin exposed: one hand face only (240 cm 2) Ventilation rate: no restriction on general ventilation characteristics Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) (for) Substance/task appropriate respirator; Optional face shield; Eye protection.				

PROC 19: Hand-mixing with intimate contact and only PPE available - LIQUID				
Product characteristics				
Concentration of the substance: 10 to 50% Concentration of the substance: 5 to 10%				
Amount used, frequency and duration of use/exposure				
Operation carried out for 480 min				
Other operational conditions affecting workers exposure				
Concentration up to 50% (large workroom, large tools)				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Above room temperature	Activity class: spreading of liquid products	Situation: spreading of liquids at surfaces or work pieces 1.0 – 3.0 m2 / hour	Containment level: n. a.
Surface of skin exposed: two hands and forearms (1980 cm 2) LEV systems (50 % reduction) Ventilation rate: 3 air changes per hour Indoor use assumed				
Concentration up to 50% (small tools)				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Above room temperature	Activity class: spreading of liquid products	Situation: spreading of liquids at surfaces or work pieces 0.3 – 1.0 m2 / hour	Containment level: n. a.
Surface of skin exposed: two hands and forearms (1980 cm 2) LEV systems (50 % reduction) Ventilation rate: 3 air changes per hour Indoor use assumed				
Concentration up to 50% (small tools)				
Substance type: Liquids Vapour pressure: 186.4 Pa	Process temperature: Above room temperature	Activity class: spreading of liquid products	Situation: spreading of liquids at surfaces or work pieces 0.3 – 1.0 m2 / hour	Containment level: n. a.
Surface of skin exposed: two hands and forearms (1980 cm 2) LEV systems (50 % reduction) Ventilation rate: 3 air changes per hour Indoor use assumed				
Condition and measures related to personal protection, hygiene and health evaluation				
Substance/task appropriate gloves; wear chemically resistant gloves (tested to EN374) in combination with specific activity training and intensive management supervision controls. Required effectiveness of RMM is 98% Skin coverage with appropriate barrier material based on potential for contact with the chemicals; Low level containment (90 % reduction) (for) Substance/task appropriate respirator; Optional face shield; Eye protection.				

3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE		
3.1 CEPE 15, 16a - Other spray coating - Volatiles / Abatement including indoor point sources		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.26	**SPERC**
Air	61.74	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.606**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.617**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.68E-4 mg/L	**0.587**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.597**
Fresh Water Food Chain (Predators)	Local PEC: 0.959 mg/kg ww	**0.072**
Marine Water Food Chain (Predators)	Local PEC: 0.089 mg/kg ww	**0.007**
Marine Water Food Chain (Top Predators)	Local PEC: 0.045 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 0.011 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.176 mg/kg ww	**0.013**

3.2 CEPE 17a - Other spray coating, indoor use - point sources – Solids		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	0	**SPERC**
Air	200.2	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 5.96E-4 mg/L Local concentration: 0 mg/L	**0.11**
Fresh Water (Sediment)	Local PEC: 0.146 mg/kg dw	**0.112**
Marine Water (Pelagic)	Local PEC: 4.91E-5 mg/L Local concentration: 0 mg/L	**0.091**
Marine Water (Sediment)	Local PEC: 0.012 mg/kg dw	**0.091**
Fresh Water Food Chain (Predators)	Local PEC: 0.407 mg/kg ww	**0.031**
Marine Water Food Chain (Predators)	Local PEC: 0.034 mg/kg ww	**0.003**
Marine Water Food Chain (Top Predators)	Local PEC: 0.034 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0 mg/L	**RCR = 0**
Air	Local PEC: 0.034 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.003 mg/kg dw Local concentration: 0.003 mg/kg dw	**0.012**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww Local PEC: 0.011 mg/kg ww	**8.421E-4**

3.3 ESVOC 11 - Industrial use in oil field drilling and production operations		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.267	**SPERC**
Air	0.09	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.62**
Fresh Water (Sediment)	Local PEC: 0.819 mg/kg dw	**0.63**
Marine Water (Pelagic)	Local PEC: 3.23E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.598**
Marine Water (Sediment)	Local PEC: 0.079 mg/kg dw	**0.608**
Fresh Water Food Chain (Predators)	Local PEC: 0.521 mg/kg ww	**0.039**
Marine Water Food Chain (Predators)	Local PEC: 0.044 mg/kg ww	**0.003**
Marine Water Food Chain (Top Predators)	Local PEC: 0.038 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**RCR = 0.013**
Air	Local PEC: 5.6E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.175 mg/kg ww	**0.013**

3.4 ESVOC 13 - Industrial use of formulated lubricants		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.266	**SPERC**
Air	63.3	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.609**
Fresh Water (Sediment)	Local PEC: 0.805 mg/kg dw	**0.619**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.599**
Fresh Water Food Chain (Predators)	Local PEC: 0.458 mg/kg ww	**0.034**
Marine Water Food Chain (Predators)	Local PEC: 0.039 mg/kg ww	**0.003**
Marine Water Food Chain (Top Predators)	Local PEC: 0.035 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**0.013**
Air	Local PEC: 0.002 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.175 mg/kg ww	**0.013**

3.5 ESVOC 38 - Use of the substance within laboratory setting, including pilot plants		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1.264	**SPERC**
Air	1.58	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.003 mg/L	**0.607**
Fresh Water (Sediment)	Local PEC: 0.804 mg/kg dw	**0.618**
Marine Water (Pelagic)	Local PEC: 3.18E-4 mg/L Local concentration: 2.69E-4 mg/L	**0.589**
Marine Water (Sediment)	Local PEC: 0.078 mg/kg dw	**0.598**
Fresh Water Food Chain (Predators)	Local PEC: 0.457 mg/kg ww	**0.034**
Marine Water Food Chain (Predators)	Local PEC: 0.039 mg/kg ww	**0.003**
Marine Water Food Chain (Top Predators)	Local PEC: 0.035 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.027 mg/L	**0.013**
Air	Local PEC: 5.68E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.261 mg/kg dw Local concentration: 0.261 mg/kg dw	**1**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.174 mg/kg ww	**0.013**

3.6 FEICA 6,7 - Industrial Use of Substances other than Solvents in Paper, Board and related Products/ Woodworking and joinery/Footwear and Leather/Textile/Transportation (Automotive/aircraft/rail vehicles) /Industrial Building Construction Adhesives/Others		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	0	**SPERC**
Air	212.5	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 5.96E-4 mg/L Local concentration: 0 mg/L	**0.11**
Fresh Water (Sediment)	Local PEC: 0.146 mg/kg dw	**0.112**
Marine Water (Pelagic)	Local PEC: 4.91E-5 mg/L Local concentration: 0 mg/L	**0.091**
Marine Water (Sediment)	Local PEC: 0.012 mg/kg dw	**0.092**
Fresh Water Food Chain (Predators)	Local PEC: 0.407 mg/kg ww	**0.031**
Marine Water Food Chain (Predators)	Local PEC: 0.034 mg/kg ww	**0.003**
Marine Water Food Chain (Top Predators)	Local PEC: 0.034 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0 mg/L	**0**
Air	Local PEC: 0.036 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.003 mg/kg dw Local concentration: 0.003 mg/kg dw	**0.013**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.012 mg/kg ww	**8.797E-4**

3.7 FEICA 8,9 - Industrial Use of Solvents in Paper, Board and related Products/ Woodworking and joinery/Footwear and Leather/Textile/Transportation (Automotive/aircraft/rail vehicles) /Industrial Building Construction Adhesives/Others adhesives		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	0	**SPERC**
Air	250	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 5.96E-4 mg/L Local concentration: 0 mg/L	**0.11**
Fresh Water (Sediment)	Local PEC: 0.146 mg/kg dw	**0.112**
Marine Water (Pelagic)	Local PEC: 4.91E-5 mg/L Local concentration: 0 mg/L	**0.091**
Marine Water (Sediment)	Local PEC: 0.012 mg/kg dw	**0.092**
Fresh Water Food Chain (Predators)	Local PEC: 0.407 mg/kg ww	**0.031**
Marine Water Food Chain (Predators)	Local PEC: 0.034 mg/kg ww	**0.003**
Marine Water Food Chain (Top Predators)	Local PEC: 0.034 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0 mg/L	**0**
Air	Local PEC: 0.042 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.004 mg/kg dw Local concentration: 0.004 mg/kg dw	**0.015**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.013 mg/kg ww	**1E-3**

Workers					
Contributing scenario	**Inhalation Long-term, systemic**	**Dermal Long-term, systemic**	**Dermal Acute local**	**Combined Routes (RCR)**	**Exposure estimation Method**
PROC 1 LIQUID	Exposure: 0.44 mg/m3 RCR = 0.014	Exposure: 0.003 mg/kg bw/day RCR = 3.857E-4	Exposure: 0.002 mg/cm2 RCR = 0.011	0.014	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 1 SOLID	Exposure: 0.032 mg/m3 RCR = 0.001	Exposure: 6.857E-4 mg/kg bw/day RCR = 7.713E-5	Exposure: 1.99E-4 mg/cm2 RCR = 0.001	0.001	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 2 LIQUID	Exposure: 0.69 mg/m3 RCR = 0.022	Exposure: 0.014 mg/kg bw/day RCR = 0.002	Exposure: 0.004 mg/cm2 RCR = 0.022	0.024	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 2 SOLID	Exposure: 0.036 mg/m3 RCR = 0.001	Exposure: 0.003 mg/kg bw/day RCR = 3.085E-4	Exposure: 8.75E-4 mg/cm RCR = 0.005	0.001	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 3 LIQUID	Exposure: 4.3 mg/m3 RCR = 0.138	Exposure: 0.003 mg/kg bw/day RCR = 3.857E-4	Exposure: 0.002 mg/cm2 RCR = 0.011	0.138	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 3 SOLID	Exposure: 0.032 mg/m3 RCR = 0.01	Exposure: 6.857E-4 mg/kg bw/day RCR = 7.713E-5	Exposure: 3.99E-4 mg/cm2 RCR = 0.002	0.010	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure

PROC 4 LIQUID	Exposure: 4.4 mg/m3 RCR = 0.142	Exposure: 0.069 mg/kg bw/day RCR = 0.008	Exposure: 0.02 mg/cm2 RCR = 0.108	0.15	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 4 SOLID	Exposure: 3 mg/m3 RCR = 0.096	Exposure: 0.014 mg/kg bw/day RCR = 0.002	Exposure: 0.004 mg/cm2 RCR = 0.022	0.098	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 5 LIQUID	Exposure: 4.4 mg/m3 RCR = 0.142	Exposure: 0.137 mg/kg bw/day RCR = 0.015	Exposure: 0.04 mg/cm2 RCR = 0.215	0.157	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 5 SOLID	Exposure: 3 mg/m3 RCR = 0.096	Exposure: 0.027 mg/kg bw/day RCR = 0.003	Exposure: 0.008 mg/cm2 RCR = 0.043	0.099	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 7 and 11 SOLID	Exposure: 13 mg/m3 (PROC 7 C up to 50%) 1.8 mg/m3 (PROC 7 C up to 10%) 1.5 mg/m3 (PROC 7 C up to 5%) 14 mg/m3 (PROC 11 C up to 50%) 6.1 mg/m3 (PROC 11 C up to 10%) 11 mg/m3 (PROC 11 C up to 7%)	Exposure: 0.429 mg/kg bw/day RCR = 0.048 RCR = 0.466 (concentrations up to 50%, PROC 7)	Exposure: 0.04 mg/cm2 RCR = 0.108	0.106 (PROC 7 C up to 10%) 0.096 (PROC 7 C up to 5%) 0 (PROC 11 C up to 50%) 0.244 (PROC 11 C up to 10%) 0.402 (PROC 11, outdoor C up to 25%) 0.466 (PROC 11, outdoor C up to 5%)	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure

	RCR 0.466 = 0.418 (PROC 11, outdoor C up to 5%) (PROC 7 C up to 50%) RCR = 0.058 (PROC 7 C up to 10%) RCR = 0.048 (PROC 7 C up to 5%) RCR = 0.9 (PROC 11 C up to 50%) RCR = 0.196 (PROC 11 C up to 10%) RCR = 0.354 (PROC 11 C up to 25% low pressure) RCR = 0.418 (PROC 11 C up to 25%; high pressure)				
PROC 8a LIQUID	Exposure: 13 mg/m3 RCR = 0.418	Exposure: 0.137 mg/kg bw/day RCR = 0.015	Exposure: 0.002 mg/cm2 RCR = 0.011	0.433	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 8a SOLID	Exposure: 3.2 mg/m3 RCR = 0.103	Exposure: 0.027 mg/kg bw/day RCR = 0.003	Exposure: 0.004 mg/cm2 RCR = 0.022	0.106	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 8b LIQUID	Exposure: 13 mg/m3 RCR = 0.418	Exposure: 0.069 mg/kg bw/day RCR = 0.008	Exposure: 0.02 mg/cm2 RCR = 0.108	0.426	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure

PROC 8b SOLID	Exposure: 3.2 mg/m3 RCR = 0.103	Exposure: 0.014 mg/kg bw/day RCR = 0.002	Exposure: 0.004 mg/cm2 RCR = 0.022	0.105	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 9 LIQUID	Exposure: 13 mg/m3 RCR = 0.418	Exposure: 0.069 mg/kg bw/day RCR = 0.008	Exposure: 0.02 mg/cm2 RCR = 0.108	0.426	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 9 SOLID	Exposure: 0.96 mg/m3 RCR = 0.031	Exposure: 0.014 mg/kg bw/day RCR = 0.002	Exposure: 0.004 mg/cm2 RCR = 0.022	0.033	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 10 LIQUID	Exposure: 16 mg/m3 (C up to 50%) 4 mg/m3 (C up to 5%) RCR = 0.515 (C up to 50%) RCR = 0.129 (C up to 5%)	Exposure: 0.274 mg/kg bw/day RCR = 0.031	Exposure: 0.04 mg/cm2 RCR = 0.108	0.546 (C up to 50%). 0.160 (C up to 5%)	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 13 LIQUID	Exposure: 12 mg/m3 (C up to 50%) 15 mg/m 3 (C up to 25%) 2.2 mg/m3 (C up to 5%) RCR = 0.386 (C up to 50%) RCR = 0.482 (C up to 25%) RCR = 0.071 (C up to 5%)	Exposure: 0.137 mg/kg bw/day RCR = 0.015	Exposure: 0.04 mg/cm2 RCR = 0.108	0.401 (C up to 50%). 0.497 (C up to 25%) 0.086 (C up to 5%)	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 14 SOLID	Exposure: 0.32 mg/m3 RCR = 0.01	Exposure: 0.007 mg/kg bw/day RCR = 7.713E-4	Exposure: 0.002 mg/cm2 RCR = 0.011	0.011	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure

PROC 15 LIQUID	Exposure: 4.2 mg/m3 RCR = 0.135	Exposure: 0.003 mg/kg bw/day RCR = 3.857E-4	Exposure: 0.002 mg/cm2 RCR = 0.011	0.135	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 15 SOLID	Exposure: 0.092 mg/m3 RCR = 0.003	Exposure: 6.857E-4 mg/kg bw/day RCR = 7.713E-5	Exposure: 3.99E-4 mg/cm 2 RCR = 0.002	0.003	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure
PROC 19 LIQUID	Exposure: 14 mg/m3 (C up to 50%, large workroom, large tools) 9.1 mg/m 3 (C up to 50%, small tools) 3.6 mg/m3 (C up to 10%) RCR = 0.45 (C up to 50%, large tools) RCR = 0.293 (C up to 50%, small tools) RCR = 0.116 (C up to 10%)	Exposure: 0.137 mg/kg bw/day RCR = 0.159	Exposure: 0.04 mg/cm2 RCR = 0.269	0.609 (C up to 50%, large tools) 0.452 (C up to 50%, small tools) 0.275 (C up to 10%)	Inhalation: external exposure estimation tool (Advanced REACH Tool.) Dermal: extended TRA Workers Dermal (acute local): external exposure estimation tool Quantitative assessment of residual exposure

4. SCALING FOR DOWNSTREAM USER

In order to adapt the operating conditions and the measurements of the risk management to the single corporate reality (scaling), downstream users may use the same calculation model used in the preparation of the data presented
EUSES 2.0 was used for estimation of environmental exposure
Advanced REACH tool (www.advancedreachtool.com) was used for estimation of workers exposure.

The determination of the levels of oil of sweet orange campaigns by environmental monitoring (environmental sampling at fixed locations and / or personal sampling) is a different approach to assess whether the downstream work within the limits set by the exposure scenario. Therefore the detection of concentrations below the DNEL documenting that the use of the substance takes place in conditions of safety (controlled risk).

1. TITLE OF EXPOSURE SCENARIO	
Consumer use Professional and consumer use of fragrances, cosmetics, detergents/maintenance products and laboratory agents Professional and consumer use of coatings/inks, lubricants and construction chemicals Professional and consumer use resulting in and after inclusion into / onto a matrix	
Environment	
Wide dispersive indoor use of processing aids in open systems	ERC 8a
Wide dispersive indoor use of reactive substances in open systems	ERC 8b
Wide dispersive outdoor use of processing aids in open systems	ERC 8d
Wide dispersive outdoor use resulting in inclusion into or onto a matrix	ERC 8f
Wide dispersive indoor use of substances in closed systems	ERC 9a
Wide dispersive outdoor use of substances in closed systems	ERC 9b
Wide dispersive outdoor use of long-life articles and materials with low release	ERC 10a
Wide dispersive indoor use of long-life articles and materials with low release	ERC 11a
Consumer	
GES4_C 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	

2. CONDITION OF USE AFFETTING EXPOSURE	
2.1 Control of environmental exposure	
2.1.1 **Professional and consumer use of fragrances, cosmetics, detergents/maintenance products and laboratory agents**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.2 **Professional and consumer use of coatings/inks, lubricants and construction chemicals**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes
2.1.3 **Professional and consumer use resulting in and after inclusion into / onto a matrix**	
Municipal sewage treatment plant	Yes [Water: 95.73%]
Discharge rate of sewage treatment plant	>= 2E3 m3/d
Application of the sewage treatment plant sludge on agricultural soil	Yes

2.2 Control of consumers exposure
GES4_C : 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
Condition and measures related to personal protection, hygiene and health evaluation
According to the Detergents regulation, sensitizing substances in detergents exceeding 0.01% by weight must be listed using the INCI nomenclature. (648/2004/EC)

3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE		
3.1 Professional and consumer use of fragrances, cosmetics, detergents/maintenance products and laboratory agents		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	1	**ERC**
Air	0	**ERC**
Soil	0	**ERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 0.003 mg/L Local concentration: 0.002 mg/L	**0.504**
Fresh Water (Sediment)	Local PEC: 0.667 mg/kg dw	**0.513**
Marine Water (Pelagic)	Local PEC: 2.62E-4 mg/L Local concentration: 2.13E-4 mg/L	**0.485**
Marine Water (Sediment)	Local PEC: 0.064 mg/kg dw	**0.493**
Fresh Water Food Chain (Predators)	Local PEC: 1.13 mg/kg ww	**0.085**
Marine Water Food Chain (Predators)	Local PEC: 0.106 mg/kg ww	**0.008**
Marine Water Food Chain (Top Predators)	Local PEC: 0.048 mg/kg ww	**0.004**
Sewage Treatment Plant (Effluent)	Local PEC: 0.021 mg/L	**0.01**
Air	Local PEC: 6.71E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.206 mg/kg dw Local concentration: 0.206 mg/kg dw	**0.789**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.138 mg/kg ww	**0.01**

3.1 Professional and consumer use of coatings/inks, lubricants and construction chemicals		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	0.138	**SPERC**
Air	0.003	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 8.88E-4 mg/L Local concentration: 2.92E-4 mg/L	**0.164**
Fresh Water (Sediment)	Local PEC: 0.218 mg/kg dw	**0.168**
Marine Water (Pelagic)	Local PEC: 7.84E-5 mg/L Local concentration: 2.92E-5 mg/L	**0.145**
Marine Water (Sediment)	Local PEC: 0.019 mg/kg dw	**0.148**
Fresh Water Food Chain (Predators)	Local PEC: 0.507 mg/kg ww	**0.038**
Marine Water Food Chain (Predators)	Local PEC: 0.044 mg/kg ww	**0.003**
Marine Water Food Chain (Top Predators)	Local PEC: 0.036 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.003 mg/L	**0.001**
Air	Local PEC: 5.62E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.028 mg/kg dw Local concentration: 0.028 mg/kg dw	**0.109**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.021 mg/kg ww	**0.002**

3.3 Professional and consumer use resulting in and after inclusion into / onto a matrix		
Environment		
Release	**Release rate (kg/day)**	**Release estimation method**
Water	0.088	**SPERC**
Air	0.003	**SPERC**
Soil	0	**SPERC**
Protection target	**Exposure concentration**	**RCR**
Fresh Water (Pelagic)	Local PEC: 7.83E-4 mg/L Local concentration: 1.87E-4 mg/L	**0.145**
Fresh Water (Sediment)	Local PEC: 0.192 mg/kg dw	**0.148**
Marine Water (Pelagic)	Local PEC: 6.78E-5 mg/L Local concentration: 1.87E-5 mg/L	**0.126**
Marine Water (Sediment)	Local PEC: 0.017 mg/kg dw	**0.128**
Fresh Water Food Chain (Predators)	Local PEC: 0.471 mg/kg ww	**0.035**
Marine Water Food Chain (Predators)	Local PEC: 0.04 mg/kg ww	**0.003**
Marine Water Food Chain (Top Predators)	Local PEC: 0.035 mg/kg ww	**0.003**
Sewage Treatment Plant (Effluent)	Local PEC: 0.002 mg/L	**8.952E-4**
Air	Local PEC: 5.55E-4 mg/m3	**not required**
Agricultural Soil	Local PEC: 0.018 mg/kg dw Local concentration: 0.018 mg/kg dw	**0.07**
Soil: Terrestrial Food Chain (Predators)	Local PEC: 0.015 mg/kg ww	**0.001**

Consumers						
Contributing scenario	**Inhalation Long-term, systemic**	**Dermal Long-term, systemic**	**Dermal Acute local**	**Oral: Acute, Systemic**	**Combinated routes**	**Exposure estimation Method**
GES4_C	Exposure: 1.94 mg/m3 RCR = 0.249	Exposure: 0.024 mg/kg bw/day RCR = 0.005	Exposure: 9.6E-4 mg/cm2 RCR = 0.01	Exposure: 0.02 mg/kg bw/day RCR = 0.005	0.259	Inhalation: external exposure estimation tool Dermal: external exposure estimation tool Dermal (acute local): external exposure estimation tool

4. SCALING FOR DOWNSTREAM USER

In order to adapt the operating conditions and the measurements of the risk management to the single corporate reality (scaling), downstream users may use the same calculation model used in the preparation of the data presented EUSES 2.0 was used for estimation of environmental exposure
Advanced REACH tool (www.advancedreachtool.com)was used for estimation of workers exposure.

The determination of the levels of oil of sweet orange campaigns by environmental monitoring (environmental sampling at fixed locations and / or personal sampling) is a different approach to assess whether the downstream work within the limits set by the exposure scenario. Therefore the detection of concentrations below the DNEL documenting that the use of the substance takes place in conditions of safety (controlled risk).