SICHERHEITSDATENBLATT

GEMÄSS EG-VERORDNUNGEN 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

Druckdatum: 06.10.2020 Version Nr.: 8 Überarbeitungsdatum: 06.10.2020

ABSCHNITT 1: BEZEICHNUNG DES STOFFS BZW. DES GEMISCHS UND DES UNTERNEHMENS

1.1 Produktidentifikator

Produktname	Melamin
Chemische Bezeichnung	2,4,6-Triamino-1,3,5-triazin
Chemische Formel	$C_3H_6N_6$
CAS-Nr.	108-78-1
EG-Nr.	203-615-4
REACH-Registrierungsnr.	01-2119485947-16-0017

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

Identifizierte Verwendung(en): Melamin ($C_3H_6N_6$) ist ein Produkt in Form eines weißen Pulvers, das für die Herstellung zahlreicher Kunstharze verwendet wird.

- Formulierung oder Umverpackung
- Verwendung als Zwischenprodukt für Harze (reagiertes Melamin)
- Verwendung als Additiv für Schaumstoffe
- Verwendung als Additiv für intumeszierende Beschichtungen
- PU-Schaumstoffe - Arbeiter (Industrie)
- Intumeszierende Beschichtungen - Arbeiter (Industrie)
- Intumeszierende Beschichtungen - Facharbeiter

Verwendungen, von denen abgeraten wird: Hinzufügung zu Lebens- oder Futtermitteln.

1.3 Einzelheiten zum Lieferanten, der das Sicherheitsdatenblatt bereitstellt

Hersteller/Lieferant	Qatar Melamine Co
Adresse	P.O. Box 50001, Mesaieed, Katar.
Telefon	(+974) 44228888
E-Mail	mktg@qafco.com.qa

Alleinvertreter eines nicht in der Gemeinschaft ansässigen Herstellers

Hersteller/Lieferant	MUNTAJAT B.V.
Adresse	Prinses Margrietplantsoen 78-A 2595 BR, Den Haag Niederlande
Telefon	+31(0)70 219 7000
E-Mail	REACH@muntajatbv.com
Website	www.muntajatbv.com

1.4 Notrufnummer

National Poisons Information Service (Birmingham)	+44 (0) 111
Bei Austritt, Leckagen, Feuer, Exposition oder Unfall wenden Sie sich bitte rund um die Uhr an CHEMTREC	Innerhalb der USA und in Kanada: 1-800-424-9300 Außerhalb der USA und von Kanada: +1 703-741-5970 und +1-703-527-3887 (R-Gespräche werden entgegengenommen)

ABSCHNITT 2: MÖGLICHE GEFAHREN

2.1 Einstufung des Stoffs oder Gemischs

Verordnung (EG) Nr. 1272/2008 (CLP): Repr. 2 :Kann vermutlich die Fruchtbarkeit beeinträchtigen.

2.2 Kennzeichnungselemente

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

Produktname: Melamin

Gefahrenpiktogramm

GHS08

Signalwort: Achtung

Gefahrenhinweise H361f: Kann vermutlich die Fruchtbarkeit beeinträchtigen.

Sicherheitshinweise P201: Vor Gebrauch besondere Anweisungen einholen.
P202: Vor Gebrauch alle Sicherheitshinweise lesen und verstehen.
P280: Schutzhandschuhe/ Schutzkleidung/Augenschutz/Gesichtsschutz tragen.
P308+P313: BEI Exposition oder falls betroffen: Ärztlichen Rat einholen/ärztliche Hilfe hinzuziehen.
P405: Unter Verschluss aufbewahren.
P501: Inhalt/Behälter im Einklang mit den lokalen, staatlichen oder nationalen Vorschriften entsorgen.

2.3 Sonstige Gefahren

Kann beim Verschlucken gesundheitsschädlich sein.
Staub kann die Haut, Augen und Luftwege reizen.

2.4 Weitere Informationen

Keine.

ABSCHNITT 3: ZUSAMMENSETZUNG/ANGABEN ZU BESTANDTEILEN

3.1 Stoffe

GEFÄHRLICHE BESTANDTEILE	CAS-Nr.	EG-Nr.	%W/W	Gefahrenhinweise	Gefahrenpiktogramm
Melamin	108-78-1	203-615-4 01-2119485947-16-0017	≥ 99	Repr. 2 H361f	GHS08

3.2 Gemische

Nicht anwendbar.

ABSCHNITT 4: ERSTE-HILFE-MASSNAHMEN

4.1 Beschreibung der Erste-Hilfe-Maßnahmen

Nach Einatmen Bei Atembeschwerden das Opfer an die frische Luft bringen und bequem setzen oder legen, um die Atmung zu erleichtern.Falls die Symptome anhalten, einen Arzt aufsuchen.

Nach Hautkontakt Nach Hautkontakt sofort gründlich mit Wasser und Seife abwaschen.

Nach Augenkontakt Zunächst gründlich mehrere Minuten lang mit Wasser ausspülen (Kontaktlinsen entfernen, wenn dies problemlos möglich ist), dann einen Arzt aufsuchen.

Nach Verschlucken Nach Verschlucken den Mund mit Wasser ausspülen (nur wenn die Person bei Bewusstsein ist).

4.2 Wichtigste akute und verzögert auftretende Symptome und Wirkungen

Staub kann die Haut, Augen und Luftwege reizen.

4.3 Hinweise auf ärztliche Soforthilfe oder Spezialbehandlung

BEI Exposition oder falls betroffen: Ärztlichen Rat einholen/ärztliche Hilfe hinzuziehen.

ABSCHNITT 5: MASSNAHMEN ZUR BRANDBEKÄMPFUNG

5.1 Löschmittel

Geeignete Löschmittel Mit Kohlendioxid, trockenen Chemikalien, Schaum oder Sprühwasser löschen.

Nicht geeignete Löschmittel Wasserstrahl.

5.2. Besondere vom Stoff oder Gemisch ausgehende Gefahren

Zersetzt sich bei Feuer und setzt giftigen Rauch frei: Kohlenmonoxid, Kohlendioxid, Stickstoffoxide. Bei einer Aufheizung von Melamin über 500 °C wird Ammoniak freigesetzt.

5.3 Hinweise für Brandbekämpfer

Brandbekämpfer müssen vollständige Schutzbekleidung einschließlich eines unabhängigen Atemschutzgeräts tragen.

ABSCHNITT 6: MASSNAHMEN BEI UNBEABSICHTIGTER FREISETZUNG

6.1 Personenbezogene Vorsichtsmaßnahmen, Schutzausrüstung und in Notfällen anzuwendende Verfahren

Eine geeignete Belüftung vorsehen. Eine geeignete Personenschutzausrüstung (einschließlich Atemschutzgerät) während der Entfernung des verschütteten Produkts vorsehen. Staubbildung vermeiden. Vermeiden, Staub einzuatmen.

6.2 Umweltschutzmaßnahmen

Nicht in die Kanalisation ableiten und nicht in Oberflächen- oder Grundwasser eindringen lassen.

6.3 Methoden und Material für die Rückhaltung und Reinigung

Verschüttete Stoffe in Behälter füllen, falls erforderlich, zuerst befeuchten, um Staubbildung zu vermeiden. Rückstände vorsichtig aufnehmen. Verschüttete Stoffe nicht mit Wasser abwaschen, andernfalls besteht die Gefahr, dass der Boden rutschig ist und die Kanalisation verstopft wird.

6.4 Verweis auf andere Abschnitte

Siehe auch Abschnitt 8, 13.

ABSCHNITT 7: HANDHABUNG UND LAGERUNG

7.1 Schutzmaßnahmen zur sicheren Handhabung

Vor Gebrauch besondere Anweisungen einholen. Vor Gebrauch alle Sicherheitshinweise lesen und verstehen. Eine geeignete Belüftung sicherstellen. Staubbildung vermeiden. Vermeiden, Staub einzuatmen. Schutzhandschuhe/ Schutzkleidung/Augenschutz/Gesichtsschutz tragen. Hände und exponierte Haut nach der Handhabung gründlich abwaschen.

7.2 Bedingungen zur sicheren Lagerung unter Berücksichtigung von Unverträglichkeiten

Vor direkter Sonneneinstrahlung schützen. Unter Verschluss aufbewahren. Trocken lagern. Behälter fest verschlossen halten.

Lagertemperatur	Raumtemperatur.
Lagerdauer	Unter normalen Lagerbedingungen stabil.
Unverträgliche Materialien:	Starke Säuren. Stark oxidierende Mittel.

7.3 Spezifische Endanwendungen

- Formulierung oder Umverpackung
- Verwendung als Zwischenprodukt für Harze (reagiertes Melamin)
- Verwendung als Additiv für Schaumstoffe
- Verwendung als Additiv für intumeszierende Beschichtungen
- PU-Schaumstoffe - Arbeiter (Industrie)
- Intumeszierende Beschichtungen - Arbeiter (Industrie)
- Intumeszierende Beschichtungen - Facharbeiter

ABSCHNITT 8: BEGRENZUNG UND ÜBERWACHUNG DER EXPOSITION/PERSÖNLICHE SCHUTZAUSRÜSTUNG

8.1 Zu überwachende Parameter

8.1.1 Grenzwerte für die Exposition am Arbeitsplatz

STOFF	CAS-Nr.	LTEL (8 Std. TWA ppm)	LTEL (8 Std. TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Hinweis
Melamin	108-78-1					Keine Zuordnung

Quelle: UK Workplace Exposure Limits EH40/2005 (Fourth edition, published 2020), United Kingdom

8.1.2 Biologischer Grenzwert Nicht bestimmt.

8.1.3 PNEC- und DNEL-Werte

DNEL / DMEL	Oral	Nach Einatmen	Hautkontakt
Industrie - Langfristig - Lokale Auswirkungen			
Industrie - Langfristig - Systemische Auswirkungen		8.3 mg/m³	11,8 mg/kg KGW/Tag
Industrie - Kurzfristig - Lokale Auswirkungen			
Industrie - Kurzfristig - Systemische Auswirkungen		82.3 mg/m³	117 mg/kg KGW/Tag

Verbraucher - Langfristig - Lokale Auswirkungen			
Verbraucher - Langfristig - Systemische Auswirkungen	0,42 mg/kg KGW/Tag	1,5 mg/m³	4,2 mg/kg KGW/Tag
Verbraucher - Kurzfristig - Lokale Auswirkungen			
Verbraucher - Kurzfristig - Systemische Auswirkungen			

Umwelt	PNEC
Aquatisches Kompartiment (einschließlich Sediment)	Süßwasser: 0,51 mg/l Diskontinuierliche Freisetzung: 2 mg/l Meerwasser: 0,051 mg/l Süßwasser (Sediment): 2,524 mg/kg TG Meerwasser (Sediment): 0,252 mg/kg TG
Terrestrisches Kompartiment	Kläranlage: 200 mg/l
Atmosphärisches Kompartiment	Boden: 0,206 mg/kg TG

8.2 Begrenzung und Überwachung der Exposition

8.2.1. Angemessene technische Kontrollen	Eine geeignete Belüftung vorsehen.
8.2.2. Persönliche Schutzausrüstung	
Augenschutz	Augenschutz tragen (Schutzbrille, Gesichtsschutz oder Sicherheitsbrille).
Hautschutz	Schutzhandschuhe tragen. Durchdringungszeit des Handschuhmaterials: siehe Angaben des Handschuhherstellers.
Atemschutz	Zugelassene Staubschutzmaske tragen, wenn bei der Handhabung Staub entsteht.
Thermische Risiken	Nicht anwendbar.
8.2.3. Begrenzung und Überwachung der Umweltexposition	Nicht in die Kanalisation ableiten und nicht in Oberflächen- oder Grundwasser eindringen lassen.

ABSCHNITT 9: PHYSIKALISCHE UND CHEMISCHE EIGENSCHAFTEN

9.1 Angaben zu den grundlegenden physikalischen und chemischen Eigenschaften

Aussehen	Pulverr. Farbe: Weiß.
Geruch	Geruchslos.
Geruchsschwelle	Nicht bestimmt.
pH	7,5-8,5 (wässrige Lösung), 20 g/l @ 20°C
Schmelzpunkt/Gefrierpunkt	354°C (gefriert nicht, wird fest)
Siedepunkt und Siedebereich	>354°C (Sublimation)
Flammpunkt	Nicht anwendbar.
Verdampfungsgeschwindigkeit	Nicht anwendbar.
Entzündbarkeit (fest, gasförmig)	Nicht entzündlich.
Obere/untere Entzündbarkeits- oder Explosionsgrenzen	Nicht verfügbar.
Dampfdruck	4,7 x 1,0E-8 Pa @ 20°C
Dampfdicht	Nicht anwendbar.
Dichte (g/ml)	1570 kg/m³
Relative Dichte	1,57
Löslichkeit(en)	Löslichkeit (Wasser) Leicht wasserlöslich: 3,48 g/l @ 20°C Löslichkeit (sonstiges) Sehr Leicht löslich: Aceton (0,3 g/l), Ethanol (0,6 g/l), Dimethylformamid (0,1 g/l), Löslich: Cellosolve-Ethyl (11,2 g/l) @ 30°C
Verteilungskoeffizient (n-Oktanol/Wasser)	-1,22 @ 20°C
Selbstentzündungstemperatur	>500°C
Zersetzungstemperatur (°C)	>354°C
Viskosität	Nicht anwendbar.
Explosive Eigenschaften	Nicht explosiv.
Oxidierende Eigenschaften	Nicht oxidierend.

9.2 Sonstige Angaben

Dissoziationskonstante	6.7 pKa @ 20°C
Molekulargewicht	126,12 g/mol

ABSCHNITT 10: STABILITÄT UND REAKTIVITÄT

10.1 Reaktivität

Unter normalen Lagerbedingungen stabil.

10.2 Chemische Stabilität

Unter normalen Lagerbedingungen stabil.

10.3 Möglichkeit gefährlicher Reaktionen

Keine gefährlichen Reaktionen bekannt, wenn für den vorgesehenen Verwendungszweck eingesetzt.

10.4 Zu vermeidende Bedingungen

Von Feuchtigkeit fernhalten.

10.5 Unverträgliche Materialien

Starke Säuren. Stark oxidierende Mittel.

10.6 Gefährliche Zersetzungsprodukte

Keine gefährlichen Zersetzungsprodukte bekannt

ABSCHNITT 11: TOXIKOLOGISCHE ANGABEN

11.1 Angaben zu toxikologischen Wirkungen

Akute Toxizität - Verschlucken	Kann beim Verschlucken gesundheitsschädlich sein. LD50 (Ratte): 3161 mg/kg
Akute Toxizität - Hautkontakt	Geringe akute Toxizität.
Akute Toxizität - Einatmen	Geringe akute Toxizität. LC50 (Ratte): >5190 mg/m³
Ätz-/Reizwirkung auf die Haut	Nicht bestimmt.
Schwere Augenschädigung/-reizung	Nicht bestimmt.
Sensibilisierung der Haut	Keine Sensibilisierung der Haut.
Sensibilisierung der Atemwege	Nicht bestimmt.
Keimzell-Mutagenität	Kein Nachweis für mutagenes Potenzial.
Karzinogenität	Nicht als karzinogen für Menschen eingestuft. LOAEL (oral): 126 mg/kg KGW/Tag (chronisch, Ratte, Blase). Statistisch gesehen wurde ein beträchtlicher Anstieg der Inzidenz von Übergangs-Zell-Karzinomen und der kombinierten Inzidenz von Übergangs-Zell-Karzinomen und Papilloma-Viren in der Harnblase bei männlichen Ratten bei einer Exposition von 4500 ppm Melamin (ca. 263 mg/kg KGW/Tag) beobachtet, aber nicht bei einer Exposition bis zu 2250 ppm Melamin. Mit einer Ausnahme wurden Harnsteine bei männlichen Ratten mit Übergangs-Zell-Karzinom festgestellt. Weibliche Ratten haben keine Tumore entwickelt, auch nicht bei einer Exposition bis zu 9000 ppm. Es wurden keine neoplastischen Erkenntnisse bei der Behandlung von weiblichen oder männlichen Mäusen festgestellt. Keine Nachweise bei Menschen.
Reproduktionstoxizität	Kann vermutlich die Fruchtbarkeit bei männlichen Ratten beeinträchtigen. NOAEL (oral): 89 mg/kg KGW/Tag (subchronisch, 168 Stunden/Woche Ratte). Bei einer Eingenerationen-Prüfung (EOGRTS) gemäß OECD TG 443 an Ratten wurden negative Auswirkungen auf das männliche Reproduktionssystem festgestellt, siehe ECHA Entscheidung Nummer TPE-D-2114373433-50-01. In Verbindung mit minimalem Zellmaterial in den Nebenhoden bei männlichen F0- und F1-Tieren wurde eine tubuläre Degeneration/Atrophie der Hoden festgestellt. Darüber hinaus wurde ein Anstieg von Spermaveränderungen (abgetrennte Köpfe) bei männlichen F0- und F1-Tieren festgestellt.
Laktation	Nicht erwartet.
STOT - einmalige Exposition	Nicht bestimmt.
STOT - wiederholte Exposition	Nicht bestimmt.
Aspirationsgefahr	Nicht erwartet.

11.2 Sonstige Angaben

Staub kann die Haut, Augen und Luftwege reizen.

ABSCHNITT 12: UMWELTBEZOGENE ANGABEN

12.1 Toxizität

Geringe Toxizität für Wasserorganismen.

Akut	LC50 (Daphnia magna): 200 mg/l
Chronisch	NOEC (Pimephales promelas): 5,1 mg/l
	NOEC (Daphnia magna): 11 mg/l
Algen	EC50 Süßwasser: 325 mg/l
	NOEC Süßwasser: 98 mg/l

12.2 Persistenz und Abbaubarkeit

Dieser Stoff ist nicht leicht biologisch abbaubar. Eine inhärente biologische Abbaubarkeit wird nicht erwartet.

12.3 Bioakkumulationspotenzial

Dieser Stoff hat kein Bioakkumulationspotenzial.
Biokonzentrationsfaktor (BCF): 3,8 ml/kg NG

12.4 Mobilität im Boden

Es wird davon ausgegangen, dass dieser Stoff eine moderate Mobilität im Boden hat.

12.5 Ergebnisse der PBT- und vPvB-Bewertung

Nicht als PBT oder vPvB eingestuft.

12.6 Andere schädliche Wirkungen

Nicht bekannt.

ABSCHNITT 13: HINWEISE ZUR ENTSORGUNG

13.1 Verfahren der Abfallbehandlung

Sichere Entsorgung von leeren Behältern und Abfall. Wenn möglich, wiederverwerten oder dem Recycling zuführen.

13.2 Weitere Informationen

Entsorgung im Einklang mit den lokalen, staatlichen oder nationalen Vorschriften.

ABSCHNITT 14: ANGABEN ZUM TRANSPORT

Nicht als gefährlich für den Transport eingestuft.

14.1 UN-Nummer

Nicht anwendbar.

14.2 Ordnungsgemäße UN-Versandbezeichnung

Nicht anwendbar.

14.3 Transportgefahrenklassen

Nicht anwendbar.

14.4 Verpackungsgruppe

Nicht anwendbar.

14.5 Umweltgefahren

Nicht als Meeresschadstoff eingestuft.

14.6 Besondere Vorsichtsmaßnahmen für den Verwender

Nicht bekannt.

14.7 Massengutbeförderung gemäß Anhang II des MARPOL-Übereinkommens und gemäß IBC-Code

Nicht bekannt.

ABSCHNITT 15: RECHTSVORSCHRIFTEN

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

Europäische Verordnungen - Genehmigungen und/oder Einschränkungen für die Verwendung

Kandidatenliste der besonders	Nicht aufgeführt

besorgniserregenden Stoffe	
REACH: ANHANG XIV Liste der zulassungspflichtigen Stoffe	Nicht aufgeführt
REACH: Anhang XVII Beschränkungen der Herstellung, des Inverkehrbringens und der Verwendung bestimmter gefährlicher Stoffe, Gemische und Erzeugnisse	Nicht aufgeführt
Fortlaufender Aktionsplan der Gemeinschaft (CoRAP)	Nicht aufgeführt
Verordnung (EG) Nr. 850/2004 des Europäischen Parlaments und des Rates vom 29. April 2004 über persistente organische Schadstoffe	Nicht aufgeführt
Verordnung (EG) Nr. 1005/2009 über Stoffe, die zum Abbau der Ozonschicht führen	Nicht aufgeführt
Verordnung (EU) N° 649/2012 des Europäischen Parlaments und des Rates vom 4. Juli 2012 über die Aus- und Einfuhr gefährlicher Chemikalien	Nicht aufgeführt

Nationale Verordnungen

Bestandsverzeichnis	Aufgeführt in: Australien, Kanada (DSL), China, Japan, Korea, Taiwan, Neuseeland (HSNO) – HSNO-Genehmigung: HSR002503, Neuseeland (NZIoC), Philippinen.

15.2 Chemische Sicherheitsbeurteilung

Es wurde eine chemische Sicherheitsbeurteilung gemäß REACH durchgeführt.

ABSCHNITT 16: SONSTIGE ANGABEN

Die folgenden Abschnitte enthalten Änderungen oder neue Hinweise: 1-16

BILDUNTERSCHRIFT

Gefahrenpiktogramm

GHS08

Gefahreneinstufung

Repr. 2: Reproduktionstoxizität, Kategorie 2

Gefahrenhinweise

H361f: Kann vermutlich die Fruchtbarkeit beeinträchtigen.

Sicherheitshinweise

P201: Vor Gebrauch besondere Anweisungen einholen.
P202: Vor Gebrauch alle Sicherheitshinweise lesen und verstehen.
P280: Schutzhandschuhe/ Schutzkleidung/Augenschutz/Gesichtsschutz tragen.
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P405: Unter Verschluss aufbewahren.
P501: Inhalt/Behälter im Einklang mit den lokalen, staatlichen oder nationalen Vorschriften entsorgen.

Akronyme

CAS: Chemical Abstracts Service
CLP: Verordnung (EG) Nr. 1272/2008 über die Einstufung, Kennzeichnung und Verpackung von Stoffen und Gemischen
DNEL: Derived No Effect Level
EG: Europäische Gemeinschaft
LTEL: Long term exposure limit (Langzeitexposition)
PBT: Persistent, Bioaccumulative and Toxic (Persistent, bioakkummulierend, toxisch)

PNEC: Predicted No Effect Concentration (vorausgesagte Konzentration eines in der Regel umweltgefährlichen Stoffes)
REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals (Registrierung, Bewertung, Zulassung und Beschränkung chemischer Stoffe)
STEL: Short term exposure limit (Kurzzeitexposition)
STOT: Specific Target Organ Toxicity (spezifische Zielorgantoxizität)
vPvB: very Persistent and very Bioaccumulative (sehr persistent und sehr bioakkummulierend)

Haftungsausschlussklausel

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	Formulation or re-packaging	
Contributing scenario controlling environmental exposure		
CS1	Formulation or re-packaging	ERC2
Contributing scenario controlling worker exposure		
CS2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	PROC2
CS3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions	PROC3
CS4	Chemical production where opportunity for exposure arises	PROC4
CS5	Mixing or blending in batch processes	PROC5
CS6	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	PROC8a
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SECTION 2:	**Conditions of use**
2.1	**Contributing scenario controlling environmental exposure:** 1.1 Formulation or re-packaging (ERC 2)
Amount used, frequency and duration of use (or from service life)	
Daily use amount at site: not relevant for the assessment as scenario specific releases are estimated Annual use amount at site: not relevant for the assessment as scenario specific releases are estimated	
Conditions and measures related to biological sewage treatment plant	
Biological STP: Standard [Effectiveness, Water: 0.169%] Discharge rate of STP: >= 2E3 m3/day Application of the STP sludge on agricultural soil: Yes	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow: >= 1.8E4 m3/day	
2.2	**Contributing scenario controlling worker exposure:** 1.2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC 2)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	

Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.3	**Contributing scenario controlling worker exposure:** 1.3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions (PROC 3)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.4	**Contributing scenario controlling worker exposure:** 1.4 Chemical production where opportunity for exposure arises (PROC 4)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.5	**Contributing scenario controlling worker exposure:** 1.5 Mixing or blending in batch processes (PROC 5)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced	

Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.6	**Contributing scenario controlling worker exposure:** 1.6 Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.7	**Contributing scenario controlling worker exposure:** 1.7 Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.8	**Contributing scenario controlling worker exposure:** 1.8 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)
Product characteristics	

Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.9	**Contributing scenario controlling worker exposure:** 1.9 Tabletting, compression, extrusion, pelletisation, granulation (PROC 14)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Place of use: Indoor Operating temperature: <= 40 °C	
2.10	**Contributing scenario controlling worker exposure:** 1.10 Use as laboratory reagent (PROC 15)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
2.11	**Contributing scenario controlling worker exposure:** 1.11 Hand-mixing with intimate contact and only PPE available (PROC 19)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 %	

Physical form of the used product: Solid (medium dusty form)
Frequency and duration of use
Duration of activity: <= 8 h/day
Technical conditions and measures to control dispersion from source towards the worker
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with specific activity training) and (other) appropriate dermal protection [Effectiveness, Dermal: 95%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

2.12	**Contributing scenario controlling worker exposure:** 1.12 Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product characteristics
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)
Frequency and duration of use
Duration of activity: <= 8 h/day
Technical conditions and measures to control dispersion from source towards the worker
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

SECTION 3:	**1.13 Exposure estimation**

3.1. Environment

Release	**Release estimation method**	**Explanations**
Water	Estimated release rate	Local release rate: 5 kg/day
Air	Estimated release rate	Local release rate: 1 kg/day
Non-Agricultural Soil	Estimated release factor	Release factor after on-site RMM: 0%

Protection target	**Exposure concentration**	**Risk quantification (RCR)**
Fresh water	Local PEC: 0.255 mg/l	0.5
Sedimentation (Fresh water)	Local PEC: 1.26 mg/kg dw	0.5
Marine water	Local PEC: 0.0255 mg/l	0.5
Sedimentation (Marine water)	Local PEC: 0.126 mg/kg dw	0.5
Sewage Treatment Plant	Local PEC: 2.496 mg/l	0.01
Agricultural soil	Local PEC: 0.029 mg/kg dw	0.14
Man via Environment - Inhalation (Systemic effects)	Concentration in air: 7.8E-5 mg/m³	< 0.01

Man via Environment - Oral	Exposure via food consumption: 0.017 mg/kg bw/day	0.04
Man via Environment - Combined routes		0.04
3.2. Worker		
Contributing scenario controlling worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC 2)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.06
Inhalation, Systemic effects, Acute	2 mg/m³	0.024
Dermal, Systemic effects, Long Term	1.37 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.176
Contributing scenario controlling worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions (PROC 3)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	0.69 mg/kg bw/day	0.058
Combined routes, Systemic effects, Long Term		0.179
Contributing scenario controlling worker exposure: Chemical production where opportunity for exposure arises (PROC 4)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.719
Contributing scenario controlling worker exposure: Mixing or blending in batch processes (PROC 5)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8b)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.353

Contributing scenario controlling worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.719
Contributing scenario controlling worker exposure: Tabletting, compression, extrusion, pelletisation, granulation (PROC 14)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	3.43 mg/kg bw/day	0.291
Combined routes, Systemic effects, Long Term		0.411
Contributing scenario controlling worker exposure: Use as laboratory reagent (PROC 15)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.06
Inhalation, Systemic effects, Acute	2 mg/m³	0.024
Dermal, Systemic effects, Long Term	0.34 mg/kg bw/day	0.029
Combined routes, Systemic effects, Long Term		0.089
Contributing scenario controlling worker exposure: Hand-mixing with intimate contact and only PPE available (PROC 19)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	3 mg/m³	0.361
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	7.072 mg/kg bw/day	0.599
Combined routes, Systemic effects, Long Term		0.961
Contributing scenario controlling worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
SECTION 4:	**1.14 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**	
Remarks on exposure data from external estimation tools: ECETOC TRA Workers 3.1: Explanation: The exposure estimates for PROC 8a are used, as TRA Workers cannot predict exposure for PROC 28 and these estimates can be considered suitable for estimating exposures during manual maintenance.		

2. Exposure Scenario 2: Use at industrial sites - Use as intermediate for resins (reacted melamine)

SECTION 1:	**Title of exposure scenario**	
	Use at industrial sites - Use as intermediate for resins (reacted melamine)	
Contributing scenario controlling environmental exposure		
CS1	Use as intermediate for resins (reacted melamine)	ERC6a, ERC6c
Contributing scenario controlling worker exposure		
CS2	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	PROC1
CS3	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	PROC2
CS4	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions	PROC3
CS5	Chemical production where opportunity for exposure arises	PROC4
CS6	Mixing or blending in batch processes	PROC5
CS7	Calendering operations	PROC6
CS8	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	PROC8a
CS9	Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC8b
CS10	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC9
CS11	Tabletting, compression, extrusion, pelletisation, granulation	PROC14
CS12	Use as laboratory reagent	PROC15
CS13	Manual maintenance (cleaning and repair) of machinery	PROC28

SECTION 2:	**Conditions of use**
2.1	**Contributing scenario controlling environmental exposure:** 2.1 Use as intermediate for resins (reacted melamine) (ERC 6a; ERC 6c)
Amount used, frequency and duration of use (or from service life)	
Daily use amount at site: not relevant for the assessment as scenario specific releases are estimated Annual use amount at site: not relevant for the assessment as scenario specific releases are estimated	
Conditions and measures related to biological sewage treatment plant	
Biological STP: Standard [Effectiveness, Water: 0.169%] Discharge rate of STP: >= 2E3 m3/day Application of the STP sludge on agricultural soil: Yes	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow: >= 1.8E4 m3/day	
2.2	**Contributing scenario controlling worker exposure:** 2.2 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC 1)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	

Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.3	**Contributing scenario controlling worker exposure:** 2.3 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC 2)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.4	**Contributing scenario controlling worker exposure:** 2.4 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions (PROC 3)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.5	**Contributing scenario controlling worker exposure:** 2.5 Chemical production where opportunity for exposure arises (PROC 4)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	

Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.6	**Contributing scenario controlling worker exposure:** 2.6 Mixing or blending in batch processes (PROC 5)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.7	**Contributing scenario controlling worker exposure:** 2.7 Calendering operations (PROC 6)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness, Dermal: 90%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.8	**Contributing scenario controlling worker exposure:** 2.8 Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)

Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.9	**Contributing scenario controlling worker exposure:** 2.9 Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.10	**Contributing scenario controlling worker exposure:** 2.10 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%]	

Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.11	**Contributing scenario controlling worker exposure:** 2.11 Tabletting, compression, extrusion, pelletisation, granulation (PROC 14)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.12	**Contributing scenario controlling worker exposure:** 2.12 Use as laboratory reagent (PROC 15)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.13	**Contributing scenario controlling worker exposure:** 2.13 Manual maintenance (cleaning and repair) of machinery (PROC 28)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%]	

Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

SECTION 3:	**2.14 Exposure estimation**

3.1. Environment

Release	**Release estimation method**	**Explanations**
Water	Estimated release rate	Local release rate: 3 kg/day
Air	Estimated release rate	Local release rate: 0.5 kg/day
Non-Agricultural Soil	Estimated release factor	Release factor after on-site RMM: 0%

Protection target	**Exposure concentration**	**Risk quantification (RCR)**
Fresh water	Local PEC: 0.155 mg/l	0.3
Sedimentation (Fresh water)	Local PEC: 1.26 mg/kg dw	0.3
Marine water	Local PEC: 0.0255 mg/l	0.3
Sedimentation (Marine water)	Local PEC: 0.126 mg/kg dw	0.3
Sewage Treatment Plant	Local PEC: 2.496 mg/l	< 0.01
Agricultural soil	Local PEC: 0.029 mg/kg dw	0.08
Man via Environment - Inhalation (Systemic effects)	Concentration in air: 7.8E-5 mg/m³	< 0.01
Man via Environment - Oral	Exposure via food consumption: 0.017 mg/kg bw/day	0.04
Man via Environment - Combined routes		0.02

3.2. Worker

Contributing scenario controlling worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC 1)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.034 mg/kg bw/day	< 0.01
Combined routes, Systemic effects, Long Term		< 0.01

Contributing scenario controlling worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC 2)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.06
Inhalation, Systemic effects, Acute	2 mg/m³	0.024
Dermal, Systemic effects, Long Term	1.37 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.176

Contributing scenario controlling worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions (PROC 3)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12

Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	0.69 mg/kg bw/day	0.058
Combined routes, Systemic effects, Long Term		0.179
Contributing scenario controlling worker exposure: Chemical production where opportunity for exposure arises (PROC 4)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.719
Contributing scenario controlling worker exposure: Mixing or blending in batch processes (PROC 5)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
Contributing scenario controlling worker exposure: Calendering operations (PROC 6)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8b)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.353
Contributing scenario controlling worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.719
Contributing scenario controlling worker exposure: Tabletting, compression, extrusion, pelletisation, granulation		

(PROC 14)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	3.43 mg/kg bw/day	0.291
Combined routes, Systemic effects, Long Term		0.411
Contributing scenario controlling worker exposure: Use as laboratory reagent (PROC 15)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.06
Inhalation, Systemic effects, Acute	2 mg/m³	0.024
Dermal, Systemic effects, Long Term	0.34 mg/kg bw/day	0.029
Combined routes, Systemic effects, Long Term		0.089
Contributing scenario controlling worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
SECTION 4:	**2.15 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**	
Remarks on exposure data from external estimation tools: ECETOC TRA Workers 3.1: Explanation: The exposure estimates for PROC 8a are used, as TRA Workers cannot predict exposure for PROC 28 and these estimates can be considered suitable for estimating exposures during manual maintenance.		

3. Exposure Scenario 3: Use at industrial sites - Use of resins with unreacted residual melamine

SECTION 1:	**Title of exposure scenario**	
	Use at industrial sites - Use of resins with unreacted residual melamine	
Contributing scenario controlling environmental exposure		
CS1	Use of resins with unreacted residual melamine	ERC5
Contributing scenario controlling worker exposure		
CS2	Industrial spraying	PROC7
CS3	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	PROC8a
CS4	Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC8b
CS5	Roller application or brushing	PROC10
CS6	Hand-mixing with intimate contact and only PPE available	PROC19
CS7	Manual maintenance (cleaning and repair) of machinery	PROC28

SECTION 2:	**Conditions of use**
2.1	**Contributing scenario controlling environmental exposure:** 3.1 Use of resins with unreacted residual melamine (ERC 5)
Amount used, frequency and duration of use (or from service life)	
Daily use amount at site: not relevant for the assessment as scenario specific releases are estimated Annual use amount at site: not relevant for the assessment as scenario specific releases are estimated	
Conditions and measures related to biological sewage treatment plant	
Biological STP: Standard [Effectiveness, Water: 0.169%] Discharge rate of STP: >= 2E3 m3/day Application of the STP sludge on agricultural soil: Yes	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow: >= 1.8E4 m3/day	
2.2	**Contributing scenario controlling worker exposure:** 3.2 Industrial spraying (PROC 7)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 5 % Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
Ventilation working room: General ventilation (mechanical) Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.3	**Contributing scenario controlling worker exposure:** 3.3 Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 5 %	

Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.4	**Contributing scenario controlling worker exposure:** 3.4 Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 5 % Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.5	**Contributing scenario controlling worker exposure:** 3.5 Roller application or brushing (PROC 10)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 5 % Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
Ventilation working room: General ventilation (mechanical) Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	

2.6	**Contributing scenario controlling worker exposure:** 3.6 Hand-mixing with intimate contact and only PPE available (PROC 19)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 5 % Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
Ventilation working room: General ventilation (mechanical) Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.7	**Contributing scenario controlling worker exposure:** 3.7 Manual maintenance (cleaning and repair) of machinery (PROC 28)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 5 % Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	

SECTION 3:	**3.8 Exposure estimation**

3.1. Environment

Release	**Release estimation method**	**Explanations**
Water	Estimated release rate	Local release rate: 0.5 kg/day
Air	Estimated release rate	Local release rate: 0 kg/day
Non-Agricultural Soil	Estimated release factor	Release factor after on-site RMM: 0%

Protection target	**Exposure concentration**	**Risk quantification (RCR)**
Fresh water	Local PEC: 0.03 mg/l	0.06
Sedimentation (Fresh water)	Local PEC: 0.148 mg/kg dw	0.06
Marine water	Local PEC: 3E-3 mg/l	0.06
Sedimentation (Marine water)	Local PEC: 0.015 mg/kg dw	0.06
Sewage Treatment Plant	Local PEC: 0.25 mg/l	< 0.01

Agricultural soil	Local PEC: 2.2E-3 mg/kg dw	0.01
Man via Environment - Inhalation (Systemic effects)	Concentration in air: 9.8E-16 mg/m³	< 0.01
Man via Environment - Oral	Exposure via food consumption: 1.09E-3 mg/kg bw/day	< 0.01
Man via Environment - Combined routes		< 0.01
3.2. Worker		
Contributing scenario controlling worker exposure: Industrial spraying (PROC 7)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	2.43 mg/m³	0.293
Inhalation, Systemic effects, Acute	2.43 mg/m³	0.03
Dermal, Systemic effects, Long Term	1.714 mg/kg bw/day	0.145
Combined routes, Systemic effects, Long Term		0.438
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.105 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.105 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	2.74 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.245
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8b)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.105 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.105 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	2.74 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.245
Contributing scenario controlling worker exposure: Roller application or brushing (PROC 10)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1.1 mg/m³	0.133
Inhalation, Systemic effects, Acute	1.1 mg/m³	0.013
Dermal, Systemic effects, Long Term	5.486 mg/kg bw/day	0.465
Combined routes, Systemic effects, Long Term		0.597
Contributing scenario controlling worker exposure: Hand-mixing with intimate contact and only PPE available (PROC 19)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.53 mg/m³	0.064
Inhalation, Systemic effects, Acute	0.53 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	5.657 mg/kg bw/day	0.479
Combined routes, Systemic effects, Long Term		0.543
Contributing scenario controlling worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.105 mg/m³	0.013
Inhalation, Systemic effects, Acute	0.105 mg/m³	< 0.01

Dermal, Systemic effects, Long Term	2.74 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.245

SECTION 4:	**3.9 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

Remarks on exposure data from external estimation tools:
Stoffenmanager 8:
Explanation: Inhalation exposure concentration estimated using Stoffenmanager® (version 8)
- Activity/type of task: Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze
- Distance to task: In the breathing zone of the worker (distance head-product < 1 m) (worst-case assumption)
- Local controls: No control measures at the source
- Ventilation working room: General ventilation (mechanical)
- Volume of the working room: 100-1000 m3
- Regular cleaning of work area (daily): Yes
- Regular inspection and maintenance (at least monthly): Yes
- Presence of secondary emission sources (worst-case assumptions);

Other workers using the same substance simultaneously: Yes
A period of evaporation, drying or curing after the activity (with prolonged emission of vapours): Yes
The concentration that can be inhaled by the worker during the task due to the activity undertaken is obtained. As the task is performed for 8 hours, the daily average concentration equals the task concentration. In accordance with the ECHA Guidance (Chapter R.14), this estimated concentration is therefore considered to be the short-term as well as the long-term inhalation exposure estimate (90th percentiles).

ECETOC TRA Workers 3.1:
Explanation: As solid is used as value for CSA, while liquid is used, it is considered appropriate to refine the exposure estimates, using the standalone version of TRA Workers (v3.1). The vapour pressure at operating temperature (40°C) used for the calculation is 3.71E-8 Pa (as calculated by Chesar).

Stoffenmanager 8:
Explanation: Inhalation exposure concentration estimated using Stoffenmanager® (version 8)
- Activity/type of task: Handling of liquids on large surfaces or large work pieces
- Distance to task: In the breathing zone of the worker (distance head-product < 1 m) (worst-case assumption)
- Local controls: No control measures at the source
- Ventilation working room: General ventilation (mechanical)
- Volume of the working room: 100-1000 m3
- Regular cleaning of work area (daily): Yes
- Regular inspection and maintenance (at least monthly): Yes
- Presence of secondary emission sources (worst-case assumptions);

Other workers using the same substance simultaneously: Yes
A period of evaporation, drying or curing after the activity (with prolonged emission of vapours): Yes
The concentration that can be inhaled by the worker during the task due to the activity undertaken is obtained. As the task is performed for 8 hours, the daily average concentration equals the task concentration. In accordance with the ECHA Guidance (Chapter R.14), this estimated concentration is therefore considered to be the short-term as well as the long-term inhalation exposure estimate (90th percentiles).

Stoffenmanager 8:
Explanation: Inhalation exposure concentration estimated using Stoffenmanager® (version 8)
- Activity/type of task: Handling of liquids using low pressure, low speed or on medium-sized surfaces
- Distance to task: In the breathing zone of the worker (distance head-product < 1 m) (worst-case assumption)
- Local controls: No control measures at the source
- Ventilation working room: General ventilation (mechanical)
- Volume of the working room: 100-1000 m3
- Regular cleaning of work area (daily): Yes
- Regular inspection and maintenance (at least monthly): Yes
- Presence of secondary emission sources (worst-case assumptions);

Other workers using the same substance simultaneously: Yes
A period of evaporation, drying or curing after the activity (with prolonged emission of vapours): Yes
The concentration that can be inhaled by the worker during the task due to the activity undertaken is obtained. As the task is performed for 8 hours, the daily average concentration equals the task concentration. In accordance with the ECHA Guidance (Chapter R.14), this estimated concentration is therefore considered to be the short-term as well as the long-term inhalation exposure estimate (90th percentiles).

ECETOC TRA Workers 3.1:

Explanation: The exposure estimates for PROC 8a are used, as TRA Workers cannot predict exposure for PROC 28 and these estimates can be considered suitable for estimating exposures during manual maintenance. The exposure estimates are calculated for using a liquid, with the standalone version of TRA Workers (v3.1). The vapour pressure at operating temperature (40°C) used for the calculation is 3.71E-8 Pa (as calculated by Chesar).

4. Exposure Scenario 4: Use at industrial sites - Use as intermediate for the production of other substances e.g. melamine salt (reacted melamine)

SECTION 1:	**Title of exposure scenario**	
	Use at industrial sites - Use as intermediate for the production of other substances e.g. melamine salt (reacted melamine)	
Contributing scenario controlling environmental exposure		
CS1	Use as intermediate for the production of other substances e.g. melamine salt (reacted melamine)	ERC6a
Contributing scenario controlling worker exposure		
CS2	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	PROC1
CS3	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	PROC2
CS4	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions	PROC3
CS5	Chemical production where opportunity for exposure arises	PROC4
CS6	Mixing or blending in batch processes	PROC5
CS7	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	PROC8a
CS8	Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC8b
CS9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC9
CS10	Use as laboratory reagent	PROC15
CS11	Manual maintenance (cleaning and repair) of machinery	PROC28

SECTION 2:	**Conditions of use**
2.1	**Contributing scenario controlling environmental exposure:** 4.1 Use as intermediate for the production of other substances e.g. melamine salt (reacted melamine) (ERC 6a)
Amount used, frequency and duration of use (or from service life)	
Daily use amount at site: not relevant for the assessment as scenario specific releases are estimated Annual use amount at site: not relevant for the assessment as scenario specific releases are estimated	
Conditions and measures related to biological sewage treatment plant	
Biological STP: Standard [Effectiveness, Water: 0.169%] Discharge rate of STP: >= 2E3 m3/day Application of the STP sludge on agricultural soil: Yes	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow: >= 1.8E4 m3/day	
2.2	**Contributing scenario controlling worker exposure:** 4.2 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC 1)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	

Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.3	**Contributing scenario controlling worker exposure:** 4.3 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC 2)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.4	**Contributing scenario controlling worker exposure:** 4.4 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions (PROC 3)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.5	**Contributing scenario controlling worker exposure:** 4.5 Chemical production where opportunity for exposure arises (PROC 4)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	

Duration of activity: <= 8 h/day
Technical conditions and measures to control dispersion from source towards the worker
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

2.6	**Contributing scenario controlling worker exposure:** 4.6 Mixing or blending in batch processes (PROC 5)

Product characteristics
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)
Frequency and duration of use
Duration of activity: <= 8 h/day
Technical conditions and measures to control dispersion from source towards the worker
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

2.7	**Contributing scenario controlling worker exposure:** 4.7 Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)

Product characteristics
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)
Frequency and duration of use
Duration of activity: <= 8 h/day
Technical conditions and measures to control dispersion from source towards the worker
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

2.8	**Contributing scenario controlling worker exposure:** 4.8 Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.9	**Contributing scenario controlling worker exposure:** 4.9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.10	**Contributing scenario controlling worker exposure:** 4.10 Use as laboratory reagent (PROC 15)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	

Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

2.11	**Contributing scenario controlling worker exposure:** 4.11 Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product characteristics
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)
Frequency and duration of use
Duration of activity: <= 8 h/day
Technical conditions and measures to control dispersion from source towards the worker
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

SECTION 3:	**4.12 Exposure estimation**

3.1. Environment

Release	**Release estimation method**	**Explanations**
Water	Estimated release rate	Local release rate: 3 kg/day
Air	Estimated release rate	Local release rate: 0.5 kg/day
Non-Agricultural Soil	Estimated release factor	Release factor after on-site RMM: 0%

Protection target	**Exposure concentration**	**Risk quantification (RCR)**
Fresh water	Local PEC: 0.155 mg/l	0.3
Sedimentation (Fresh water)	Local PEC: 0.766 mg/kg dw	0.3
Marine water	Local PEC: 0.0155 mg/l	0.3
Sedimentation (Marine water)	Local PEC: 0.077 mg/kg dw	0.3
Sewage Treatment Plant	Local PEC: 1.497 mg/l	< 0.01
Agricultural soil	Local PEC: 0.02917 mg/kg dw	0.08
Man via Environment - Inhalation (Systemic effects)	Concentration in air: 3.97E-5 mg/m³	< 0.01
Man via Environment - Oral	Exposure via food consumption: 9.7E-3 mg/kg bw/day	0.02
Man via Environment – Combined routes		0.02

3.2. Worker

Contributing scenario controlling worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC 1)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	< 0.01

Inhalation, Systemic effects, Acute	0.04 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.034 mg/kg bw/day	< 0.01
Combined routes, Systemic effects, Long Term		< 0.01
Contributing scenario controlling worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC 2)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.06
Inhalation, Systemic effects, Acute	2 mg/m³	0.024
Dermal, Systemic effects, Long Term	1.37 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.176
Contributing scenario controlling worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions (PROC 3)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	0.69 mg/kg bw/day	0.058
Combined routes, Systemic effects, Long Term		0.179
Contributing scenario controlling worker exposure: Chemical production where opportunity for exposure arises (PROC 4)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.719
Contributing scenario controlling worker exposure: Mixing or blending in batch processes (PROC 5)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8b)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.353

Contributing scenario controlling worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.719
Contributing scenario controlling worker exposure: Use as laboratory reagent (PROC 15)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.06
Inhalation, Systemic effects, Acute	2 mg/m³	0.024
Dermal, Systemic effects, Long Term	0.34 mg/kg bw/day	0.029
Combined routes, Systemic effects, Long Term		0.089
Contributing scenario controlling worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
SECTION 4:	**4.13 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**	
Remarks on exposure data from external estimation tools: ECETOC TRA Workers 3.1: Explanation: The exposure estimates for PROC 8a are used, as TRA Workers cannot predict exposure for PROC 28 and these estimates can be considered suitable for estimating exposures during manual maintenance.		

5. Exposure Scenario 5: Use at industrial sites - Use as additive in foams

SECTION 1:	**Title of exposure scenario**	
	Use at industrial sites - Use as additive in foams	
Contributing scenario controlling environmental exposure		
CS1	Use as additive in foams	ERC5
Contributing scenario controlling worker exposure		
CS2	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	PROC1
CS3	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	PROC2
CS4	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions	PROC3
CS5	Chemical production where opportunity for exposure arises	PROC4
CS6	Mixing or blending in batch processes	PROC5
CS7	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	PROC8a
CS8	Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC8b
CS9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC9
CS10	Use as laboratory reagent	PROC15
CS11	Hand-mixing with intimate contact and only PPE available	PROC19
CS12	Manual maintenance (cleaning and repair) of machinery	PROC28
Subsequent service life exposure scenario(s):		
ES8	Service life (worker at industrial site) - PU foams - Workers (industrial)	
ES11	Service life (consumers) - PU foams – Consumers	

SECTION 2:	**Conditions of use**
2.1	**Contributing scenario controlling environmental exposure:** 5.1 Use as additive in foams (ERC 5)
Amount used, frequency and duration of use (or from service life)	
Daily use amount at site: not relevant for the assessment as scenario specific releases are estimated Annual use amount at site: not relevant for the assessment as scenario specific releases are estimated	
Conditions and measures related to biological sewage treatment plant	
Biological STP: Standard [Effectiveness, Water: 0.169%] Discharge rate of STP: >= 2E3 m3/day Application of the STP sludge on agricultural soil: Yes	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow: >= 1.8E4 m3/day	
2.2	**Contributing scenario controlling worker exposure:** 5.2 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC 1)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%]	

Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.3	**Contributing scenario controlling worker exposure:** 5.3 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC 2)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.4	**Contributing scenario controlling worker exposure:** 5.4 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions (PROC 3)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.5	**Contributing scenario controlling worker exposure:** 5.5 Chemical production where opportunity for exposure arises (PROC 4)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 %	

Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.6	**Contributing scenario controlling worker exposure:** 5.6 Mixing or blending in batch processes (PROC 5)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.7	**Contributing scenario controlling worker exposure:** 5.7 Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	

Place of use: Indoor Operating temperature: <= 40 °C	
2.8	**Contributing scenario controlling worker exposure:** 5.8 Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.9	**Contributing scenario controlling worker exposure:** 5.9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.10	**Contributing scenario controlling worker exposure:** 5.10 Use as laboratory reagent (PROC 15)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%]	

Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.11	**Contributing scenario controlling worker exposure:** 5.11 Hand-mixing with intimate contact and only PPE available (PROC 19)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 4 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with specific activity training) and (other) appropriate dermal protection [Effectiveness, Dermal: 95%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.12	**Contributing scenario controlling worker exposure:** 5.12 Manual maintenance (cleaning and repair) of machinery (PROC 28)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
SECTION 3:	**5.13 Exposure estimation**

3.1. Environment		
Release	**Release estimation method**	**Explanations**
Water	Estimated release rate	Local release rate: 3 kg/day

Air	Estimated release rate	Local release rate: 0.5 kg/day
Non-Agricultural Soil	Estimated release factor	Release factor after on-site RMM: 0%

Protection target	**Exposure concentration**	**Risk quantification (RCR)**
Fresh water	Local PEC: 0.155 mg/l	0.3
Sedimentation (Fresh water)	Local PEC: 0.766 mg/kg dw	0.3
Marine water	Local PEC: 0.0155 mg/l	0.3
Sedimentation (Marine water)	Local PEC: 0.077 mg/kg dw	0.3
Sewage Treatment Plant	Local PEC: 1.497 mg/l	< 0.01
Agricultural soil	Local PEC: 0.017 mg/kg dw	0.08
Man via Environment - Inhalation (Systemic effects)	Concentration in air: 3.971E-5 mg/m³	< 0.01
Man via Environment - Oral	Exposure via food consumption: 9.7E-3 mg/kg bw/day	0.02
Man via Environment – Combined routes		0.02

3.2. Worker

Contributing scenario controlling worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC 1)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.01 mg/m³	< 0.01
Inhalation, Systemic effects, Acute	0.04 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	0.034 mg/kg bw/day	< 0.01
Combined routes, Systemic effects, Long Term		< 0.01

Contributing scenario controlling worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC 2)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.06
Inhalation, Systemic effects, Acute	2 mg/m³	0.024
Dermal, Systemic effects, Long Term	1.37 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.176

Contributing scenario controlling worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions (PROC 3)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	0.69 mg/kg bw/day	0.058
Combined routes, Systemic effects, Long Term		0.179

Contributing scenario controlling worker exposure: Chemical production where opportunity for exposure arises (PROC 4)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.719

Contributing scenario controlling worker exposure: Mixing or blending in batch processes (PROC 5)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**

Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8b)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.353
Contributing scenario controlling worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.719
Contributing scenario controlling worker exposure: Use as laboratory reagent (PROC 15)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.06
Inhalation, Systemic effects, Acute	2 mg/m³	0.024
Dermal, Systemic effects, Long Term	0.34 mg/kg bw/day	0.029
Combined routes, Systemic effects, Long Term		0.089
Contributing scenario controlling worker exposure: Hand-mixing with intimate contact and only PPE available (PROC 19)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	3 mg/m³	0.361
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	7.072 mg/kg bw/day	0.599
Combined routes, Systemic effects, Long Term		0.961
Contributing scenario controlling worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835

SECTION 4:	**5.14 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**
Remarks on exposure data from external estimation tools: ECETOC TRA Workers 3.1: Explanation: The exposure estimates for PROC 8a are used, as TRA Workers cannot predict exposure for PROC 28 and these estimates can be considered suitable for estimating exposures during manual maintenance.	

6. Exposure Scenario 6: Use at industrial sites - Use as additive in intumescent coatings

SECTION 1:	**Title of exposure scenario**	
	Use at industrial sites - Use as additive in intumescent coatings	
Contributing scenario controlling environmental exposure		
CS1	Use as additive in intumescent coatings	ERC5
Contributing scenario controlling worker exposure		
CS2	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions	PROC3
CS3	Chemical production where opportunity for exposure arises	PROC4
CS4	Mixing or blending in batch processes	PROC5
CS5	Industrial spraying with Local Exhaust Ventilation (LEV)	PROC7
CS6	Industrial spraying without Local Exhaust Ventilation (LEV)	PROC7
CS7	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	PROC8a
CS8	Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC8b
CS9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC9
CS10	Roller application or brushing	PROC10
CS11	Treatment of articles by dipping and pouring	PROC13
CS12	Use as laboratory reagent	PROC15
CS13	Hand-mixing with intimate contact and only PPE available	PROC19
CS14	Manual maintenance (cleaning and repair) of machinery	PROC28
Subsequent service life exposure scenario(s):		
ES9	Service life (worker at industrial site) - Intumescent coatings - Workers (industrial)	
ES10	Service life (professional worker) - Intumescent coatings - Professional Workers	
ES12	Service life (consumers) - Intumescent coating – Consumers	

SECTION 2:	**Conditions of use**
2.1	**Contributing scenario controlling environmental exposure:** 6.1 Use as additive in intumescent coatings (ERC 5)
Amount used, frequency and duration of use (or from service life)	
Daily use amount at site: not relevant for the assessment as scenario specific releases are estimated Annual use amount at site: not relevant for the assessment as scenario specific releases are estimated	
Conditions and measures related to biological sewage treatment plant	
Biological STP: Standard [Effectiveness, Water: 0.169%] Discharge rate of STP: >= 2E3 m3/day Application of the STP sludge on agricultural soil: Yes	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow: >= 1.8E4 m3/day	
2.2	**Contributing scenario controlling worker exposure:** 6.2 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions (PROC 3)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	

Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.3	**Contributing scenario controlling worker exposure:** 6.3 Chemical production where opportunity for exposure arises (PROC 4)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.4	**Contributing scenario controlling worker exposure:** 6.4 Mixing or blending in batch processes (PROC 5)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.5	**Contributing scenario controlling worker exposure:** 6.5 Industrial spraying with Local Exhaust Ventilation (LEV) (PROC 7)
Product characteristics	

Percentage (w/w) of substance in mixture/article: <= 30 % Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
Ventilation working room: General ventilation (mechanical) Occupational Health and Safety Management System: Advanced Local exhaust ventilation: Yes (TRA Effectiveness) [Effectiveness, Inhalation: 95%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.6	**Contributing scenario controlling worker exposure:** 6.6 Industrial spraying without Local Exhaust Ventilation (LEV) (PROC 7)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 30 % Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
Ventilation working room: General ventilation (mechanical) Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: Yes (Respirator with APF of 10) [Effectiveness, Inhalation: 90%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.7	**Contributing scenario controlling worker exposure:** 6.7 Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	

Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.8	**Contributing scenario controlling worker exposure:** 6.8 Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.9	**Contributing scenario controlling worker exposure:** 6.9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.10	**Contributing scenario controlling worker exposure:** 6.10 Roller application or brushing (PROC 10)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 30 % Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	

Ventilation working room: General ventilation (mechanical) Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.11	**Contributing scenario controlling worker exposure:** 6.11 Treatment of articles by dipping and pouring (PROC 13)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 30 % Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.12	**Contributing scenario controlling worker exposure:** 6.12 Use as laboratory reagent (PROC 15)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.13	**Contributing scenario controlling worker exposure:** 6.13 Hand-mixing with intimate contact and only PPE available (PROC 19)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 30 %	

Physical form of the used product: Liquid
Frequency and duration of use
Duration of activity: <= 8 h/day
Technical conditions and measures to control dispersion from source towards the worker
Ventilation working room: General ventilation (mechanical) Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with specific activity training) and (other) appropriate dermal protection [Effectiveness, Dermal: 95%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

2.14	**Contributing scenario controlling worker exposure:** 6.14 Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product characteristics
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)
Frequency and duration of use
Duration of activity: <= 8 h/day
Technical conditions and measures to control dispersion from source towards the worker
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

SECTION 3:	**6.15 Exposure estimation**

3.1. Environment

Release	**Release estimation method**	**Explanations**
Water	Estimated release rate	Local release rate: 3 kg/day
Air	Estimated release rate	Local release rate: 0.5 kg/day
Non-Agricultural Soil	Estimated release factor	Release factor after on-site RMM: 0%

Protection target	**Exposure concentration**	**Risk quantification (RCR)**
Fresh water	Local PEC: 0.155 mg/l	0.3
Sedimentation (Fresh water)	Local PEC: 0.766 mg/kg dw	0.3
Marine water	Local PEC: 0.0155 mg/l	0.3
Sedimentation (Marine water)	Local PEC: 0.077 mg/kg dw	0.3
Sewage Treatment Plant	Local PEC: 1.497 mg/l	< 0.01
Agricultural soil	Local PEC: 0.017 mg/kg dw	0.08
Man via Environment - Inhalation (Systemic effects)	Concentration in air: 3.97E-5 mg/m³	< 0.01

Man via Environment - Oral	Exposure via food consumption: 9.7E-3 mg/kg bw/day	0.02
Man via Environment – Combined routes		0.02
3.2. Worker		
Contributing scenario controlling worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions (PROC 3)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	0.69 mg/kg bw/day	0.058
Combined routes, Systemic effects, Long Term		0.179
Contributing scenario controlling worker exposure: Chemical production where opportunity for exposure arises (PROC 4)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.719
Contributing scenario controlling worker exposure: Mixing or blending in batch processes (PROC 5)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
Contributing scenario controlling worker exposure: Industrial spraying with Local Exhaust Ventilation (LEV) (PROC 7)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.4 mg/m³	0.048
Inhalation, Systemic effects, Acute	0.4 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	8.572 mg/kg bw/day	0.726
Combined routes, Systemic effects, Long Term		0.775
Contributing scenario controlling worker exposure: Industrial spraying without Local Exhaust Ventilation (LEV) (PROC 7)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.795 mg/m³	0.096
Inhalation, Systemic effects, Acute	0.795 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	8.572 mg/kg bw/day	0.726
Combined routes, Systemic effects, Long Term		0.822
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835

Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8b)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.353
Contributing scenario controlling worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.719
Contributing scenario controlling worker exposure: Roller application or brushing (PROC 10)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	3.59 mg/m³	0.433
Inhalation, Systemic effects, Acute	3.59 mg/m³	0.044
Dermal, Systemic effects, Long Term	5.486 mg/kg bw/day	0.465
Combined routes, Systemic effects, Long Term		0.897
Contributing scenario controlling worker exposure: Treatment of articles by dipping and pouring (PROC 13)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.525 mg/m³	0.063
Inhalation, Systemic effects, Acute	0.525 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.296
Contributing scenario controlling worker exposure: Use as laboratory reagent (PROC 15)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.5 mg/m³	0.06
Inhalation, Systemic effects, Acute	2 mg/m³	0.024
Dermal, Systemic effects, Long Term	0.34 mg/kg bw/day	0.029
Combined routes, Systemic effects, Long Term		0.089
Contributing scenario controlling worker exposure: Hand-mixing with intimate contact and only PPE available (PROC 19)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1.74 mg/m³	0.21
Inhalation, Systemic effects, Acute	1.74 mg/m³	0.021
Dermal, Systemic effects, Long Term	7.072 mg/kg bw/day	0.599
Combined routes, Systemic effects, Long Term		0.809
Contributing scenario controlling worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243

Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835

SECTION 4:	**6.16 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

Remarks on exposure data from external estimation tools:
Stoffenmanager 8:
Explanation: Inhalation exposure concentration estimated using Stoffenmanager® (version 8)
- Activity/type of task: Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze
- Distance to task: In the breathing zone of the worker (distance head-product < 1 m) (worst-case assumption)
- Local controls: No control measures at the source (refinement due to LEV done outside Stoffenmanager®, see below)
- Ventilation working room: General ventilation (mechanical)
- Volume of the working room: 100-1000 m3
- Regular cleaning of work area (daily): Yes
- Regular inspection and maintenance (at least monthly): Yes
- Presence of secondary emission sources (worst-case assumptions);

Other workers using the same substance simultaneously: Yes
A period of evaporation, drying or curing after the activity (with prolonged emission of vapours): Yes
The concentration during the task due to the activity undertaken is estimated to be 7.95 mg/m3, resulting in an exposure concentration of 0.4 mg/m3 due to the use of LEV with an effectiveness of 95% (TRA effectiveness). As the task is performed for 8 hours, the daily average concentration equals the task concentration. In accordance with the ECHA Guidance (Chapter R.14), this estimated concentration is therefore considered to be the short-term as well as the long-term inhalation exposure estimate (90th percentiles).

Stoffenmanager 8:
Explanation: Inhalation exposure concentration estimated using Stoffenmanager® (version 8)
- Activity/type of task: Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze
- Distance to task: In the breathing zone of the worker (distance head-product < 1 m) (worst-case assumption)
- Local controls: No control measures at the source
- Ventilation working room: General ventilation (mechanical)
- Volume of the working room: 100-1000 m3
- Regular cleaning of work area (daily): Yes
- Regular inspection and maintenance (at least monthly): Yes
- Presence of secondary emission sources (worst-case assumptions);

Other workers using the same substance simultaneously: Yes
A period of evaporation, drying or curing after the activity (with prolonged emission of vapours): Yes
The concentration during the task due to the activity undertaken is estimated to be 7.95 mg/m3, resulting in an exposure concentration of 0.795 mg/m3 due to the use of respiratory protection with an effectiveness of 90%. As the task is performed for 8 hours, the daily average concentration equals the task concentration. In accordance with the ECHA Guidance (Chapter R.14), this estimated concentration is therefore considered to be the short-term as well as the long-term inhalation exposure estimate (90th percentiles).

Stoffenmanager 8:
Explanation: Inhalation exposure concentration estimated using Stoffenmanager® (version 8)
- Activity/type of task: Handling of liquids on large surfaces or large work pieces
- Distance to task: In the breathing zone of the worker (distance head-product < 1 m) (worst-case assumption)
- Local controls: No control measures at the source
- Ventilation working room: General ventilation (mechanical)
- Volume of the working room: 100-1000 m3
- Regular cleaning of work area (daily): Yes
- Regular inspection and maintenance (at least monthly): Yes
- Presence of secondary emission sources (worst-case assumptions);

Other workers using the same substance simultaneously: Yes
A period of evaporation, drying or curing after the activity (with prolonged emission of vapours): Yes
The concentration that can be inhaled by the worker during the task due to the activity undertaken is obtained. As the task is performed for 8 hours, the daily average concentration equals the task concentration. In accordance with the ECHA Guidance (Chapter R.14), this estimated concentration is therefore considered to be the short-term as well as the long-term inhalation exposure estimate (90th percentiles).

ECETOC TRA Workers 3.1:
Explanation: As solid is used as value for CSA, while liquid is used, it is considered appropriate to refine the exposure estimates, using the standalone version of TRA Workers (v3.1). The vapour pressure at operating temperature (40°C) used for the calculation is 3.71E-8 Pa (as calculated by Chesar).

Stoffenmanager 8:
Explanation: Inhalation exposure concentration estimated using Stoffenmanager® (version 8)
- Activity/type of task: Handling of liquids using low pressure, low speed or on medium-sized surfaces
- Distance to task: In the breathing zone of the worker (distance head-product < 1 m) (worst-case assumption)
- Local controls: No control measures at the source
- Ventilation working room: General ventilation (mechanical)
- Volume of the working room: 100-1000 m3
- Regular cleaning of work area (daily): Yes
- Regular inspection and maintenance (at least monthly): Yes
- Presence of secondary emission sources (worst-case assumptions);

Other workers using the same substance simultaneously: Yes
A period of evaporation, drying or curing after the activity (with prolonged emission of vapours): Yes
The concentration that can be inhaled by the worker during the task due to the activity undertaken is obtained. As the task is performed for 8 hours, the daily average concentration equals the task concentration. In accordance with the ECHA Guidance (Chapter R.14), this estimated concentration is therefore considered to be the short-term as well as the long-term inhalation exposure estimate (90th percentiles).

ECETOC TRA Workers 3.1:
Explanation: The exposure estimates for PROC 8a are used, as TRA Workers cannot predict exposure for PROC 28 and these estimates can be considered suitable for estimating exposures during manual maintenance.

7. Exposure Scenario 7: Widespread use by professional workers - Use as additive in intumescent coatings

SECTION 1:	**Title of exposure scenario**	
	Widespread use by professional workers - Use as additive in intumescent coatings	
Contributing scenario controlling environmental exposure		
CS1	Use as additive in intumescent coatings	ERC5
Contributing scenario controlling worker exposure		
CS2	Mixing or blending in batch processes	PROC5
CS3	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	PROC8a
CS4	Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC8b
CS5	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC9
CS6	Roller application or brushing	PROC10
	Non industrial spraying	PROC11
CS7	Treatment of articles by dipping and pouring	PROC13
CS8	Hand-mixing with intimate contact and only PPE available	PROC19
CS9	Manual maintenance (cleaning and repair) of machinery	PROC28
Subsequent service life exposure scenario(s):		
ES10	Service life (professional worker) - Intumescent coatings - Professional Workers	
ES12	Service life (consumers) - Intumescent coating – Consumers	
SECTION 2:	**Conditions of use**	
2.1	**Contributing scenario controlling environmental exposure:** 7.1 Use as additive in intumescent coatings (ERC 8c, ERC 8f)	
Amount used, frequency and duration of use (or from service life)		
Daily local widespread use amount: not relevant for the assessment as scenario specific releases are estimated		
Conditions and measures related to biological sewage treatment plant		
Biological STP: Standard [Effectiveness, Water: 0.169%] Discharge rate of STP: >= 2E3 m3/day Application of the STP sludge on agricultural soil: Yes		
Other given operational conditions affecting environmental exposure		
Receiving surface water flow: >= 1.8E4 m3/day		
2.2	**Contributing scenario controlling worker exposure:** 7.2 Mixing or blending in batch processes (PROC 5)	
Product characteristics		
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)		
Frequency and duration of use		
Duration of activity: <= 8 h/day		
Technical conditions and measures to control dispersion from source towards the worker		
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Basic Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]		
Conditions and measures related to personal protection, hygiene and health evaluation		
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]		
Other given operational conditions affecting workers exposure		

Place of use: Indoor Operating temperature: <= 40 °C	
2.3	**Contributing scenario controlling worker exposure:** 7.3 Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 30 % Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Basic Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.4	**Contributing scenario controlling worker exposure:** 7.4 Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Basic Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.5	**Contributing scenario controlling worker exposure:** 7.5 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	

General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Basic Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.6	**Contributing scenario controlling worker exposure:** 7.6 Roller application or brushing (PROC 10)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 30 % Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
Ventilation working room: General ventilation (mechanical) Occupational Health and Safety Management System: Basic Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.7	**Contributing scenario controlling worker exposure:** 7.7 Non industrial spraying (PROC 11)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 30 % Physical form of the used product: Liquid	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
Ventilation working room: General ventilation (mechanical) Occupational Health and Safety Management System: Basic Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: Yes (Respirator with APF of 20) [Effectiveness, Inhalation: 95%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness, Dermal: 90%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.8	**Contributing scenario controlling worker exposure:** 7.8 Treatment of articles by dipping and pouring (PROC 13)
Product characteristics	

Percentage (w/w) of substance in mixture/article: <= 30 % Physical form of the used product: Liquid
Frequency and duration of use
Duration of activity: <= 8 h/day
Technical conditions and measures to control dispersion from source towards the worker
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Basic Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

2.9	**Contributing scenario controlling worker exposure:** 7.9 Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product characteristics
Percentage (w/w) of substance in mixture/article: <= 30 % Physical form of the used product: Liquid
Frequency and duration of use
Duration of activity: <= 8 h/day
Technical conditions and measures to control dispersion from source towards the worker
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Basic Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

SECTION 3:	**7.10 Exposure estimation**

3.1. Environment

Release	**Release estimation method**	**Explanations**
Water	Estimated release rate	Local release rate: 0 kg/day
Air	Estimated release rate	Local release rate: 0 kg/day
Non-Agricultural Soil	Estimated release factor	Release factor after on-site RMM: 0%

Protection target	**Exposure concentration**	**Risk quantification (RCR)**
Fresh water	Local PEC: 5.0E-3 mg/l	0.01
Sedimentation (Fresh water)	Local PEC: 0.025 mg/kg dw	0.01
Marine water	Local PEC: 5.0E-4 mg/l	0.01
Sedimentation (Marine water)	Local PEC: 2.4E-3 mg/kg dw	0.01
Sewage Treatment Plant	Local PEC: 0 mg/l	< 0.01
Agricultural soil	Local PEC: 2.52E-12 mg/kg dw	< 0.01
Man via Environment - Inhalation (Systemic	Concentration in air:	< 0.01

effects)	1.62E-21 mg/m³	
Man via Environment - Oral	Exposure via food consumption: 1.74E-4 mg/kg bw/day	< 0.01
Man via Environment – Combined routes		< 0.01
3.2. Worker		
Contributing scenario controlling worker exposure: Mixing or blending in batch processes (PROC 5)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.525 mg/m³	0.063
Inhalation, Systemic effects, Acute	0.525 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.296
Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8b)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.742 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.835
Contributing scenario controlling worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	1.372 mg/kg bw/day	0.116
Combined routes, Systemic effects, Long Term		0.719
Contributing scenario controlling worker exposure: Roller application or brushing (PROC 10)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	3.61 mg/m³	0.435
Inhalation, Systemic effects, Acute	3.61 mg/m³	0.044
Dermal, Systemic effects, Long Term	5.486 mg/kg bw/day	0.465
Combined routes, Systemic effects, Long Term		0.9
Contributing scenario controlling worker exposure: Non industrial spraying (PROC 11)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.398 mg/m³	0.048
Inhalation, Systemic effects, Acute	0.398 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	10.71 mg/kg bw/day	0.908
Combined routes, Systemic effects, Long Term		0.956

Contributing scenario controlling worker exposure: Treatment of articles by dipping and pouring (PROC 13)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.525 mg/m³	0.063
Inhalation, Systemic effects, Acute	0.525 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.296
Contributing scenario controlling worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)		
Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	0.525 mg/m³	0.063
Inhalation, Systemic effects, Acute	0.525 mg/m³	< 0.01
Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	0.232
Combined routes, Systemic effects, Long Term		0.296

SECTION 4:	**7.11 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

Remarks on exposure data from external estimation tools:
ECETOC TRA Workers 3.1:
Explanation: As solid is used as value for CSA, while liquid is used, it is considered appropriate to refine the exposure estimates, using the standalone version of TRA Workers (v3.1). The vapour pressure at operating temperature (40°C) used for the calculation is 3.71E-8 Pa (as calculated by Chesar).

Stoffenmanager 8:
Explanation: Inhalation exposure concentration estimated using Stoffenmanager® (version 8)
- Activity/type of task: Handling of liquids on large surfaces or large work pieces
- Distance to task: In the breathing zone of the worker (distance head-product < 1 m) (worst-case assumption)
- Local controls: No control measures at the source
- Ventilation working room: General ventilation (mechanical)
- Volume of the working room: 100-1000 m3
- Regular cleaning of work area (daily): No
- Regular inspection and maintenance (at least monthly): No
- Presence of secondary emission sources (worst-case assumptions);

Other workers using the same substance simultaneously: Yes
A period of evaporation, drying or curing after the activity (with prolonged emission of vapours): Yes
The concentration that can be inhaled by the worker during the task due to the activity undertaken is obtained. As the task is performed for 8 hours, the daily average concentration equals the task concentration. In accordance with the ECHA Guidance (Chapter R.14), this estimated concentration is therefore considered to be the short-term as well as the long-term inhalation exposure estimate (90th percentiles).

Stoffenmanager 8:
Explanation: Inhalation exposure concentration estimated using Stoffenmanager® (version 8)
- Activity/type of task: Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze
- Distance to task: In the breathing zone of the worker (distance head-product < 1 m) (worst-case assumption)
- Local controls: No control measures at the source
- Ventilation working room: General ventilation (mechanical)
- Volume of the working room: 100-1000 m3
- Regular cleaning of work area (daily): No
- Regular inspection and maintenance (at least monthly): No
- Presence of secondary emission sources (worst-case assumptions);

Other workers using the same substance simultaneously: Yes
A period of evaporation, drying or curing after the activity (with prolonged emission of vapours): Yes
The concentration during the task due to the activity undertaken is estimated to be 7.96 mg/m3, resulting in an exposure concentration of 0.398 mg/m3 due to the use of respiratory protection. As the task is performed for 8 hours, the daily average concentration equals the task concentration. In accordance with the ECHA Guidance (Chapter R.14), this estimated concentration is therefore considered to be the short-term as well as the long-term inhalation exposure estimate (90th percentiles).

ECETOC TRA Workers 3.1:

Explanation: The exposure estimates for PROC 8a are used, as TRA Workers cannot predict exposure for PROC 28 and these estimates can be considered suitable for estimating exposures during manual maintenance. The exposure estimates are calculated for using a liquid, with the standalone version of TRA Workers (v3.1). The vapour pressure at operating temperature (40°C) used for the calculation is 3.71E-8 Pa (as calculated by Chesar).

8. Exposure Scenario 8: Service life (worker at industrial site) - PU foams - Workers (industrial)

SECTION 1:	**Title of exposure scenario**	
	Service life (worker at industrial site) - PU foams - Workers (industrial)	
Contributing scenario controlling environmental exposure		
CS1	PU foams - Workers (industrial)	ERC12a
Contributing scenario controlling worker exposure		
CS2	Low energy manipulation of substances bound in materials and/or articles	PROC21
CS3	High (mechanical) energy work-up of substances bound in materials and/or articles	PROC24
Exposure scenario(s) of the uses leading to the inclusion of the substance into the article(s):		
ES5	Use at industrial sites - Use as additive in foams	

SECTION 2:	**Conditions of use**
2.1	**Contributing scenario controlling environmental exposure:** 8.1 PU foams - Workers (industrial) (ERC 12a)
Amount used, frequency and duration of use (or from service life)	
Daily use amount at site: not relevant for the assessment as scenario specific releases are estimated Annual use amount at site: not relevant for the assessment as scenario specific releases are estimated	
Conditions and measures related to biological sewage treatment plant	
Biological STP: Standard [Effectiveness, Water: 0.169%] Discharge rate of STP: >= 2E3 m3/day Application of the STP sludge on agricultural soil: Yes	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow: >= 1.8E4 m3/day	
2.2	**Contributing scenario controlling worker exposure:** 8.2 Low energy manipulation of substances bound in materials and/or articles (PROC 21)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.3	**Contributing scenario controlling worker exposure:** 8.3 High (mechanical) energy work-up of substances bound in materials and/or articles (PROC 24)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	

Technical conditions and measures to control dispersion from source towards the worker
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

SECTION 3:	**8.4 Exposure estimation**

3.1. Environment

Release	**Release estimation method**	**Explanations**
Water	Estimated release rate	Local release rate: 0 kg/day
Air	Estimated release rate	Local release rate: 0 kg/day
Non-Agricultural Soil	Estimated release factor	Release factor after on-site RMM: 0%

Protection target	**Exposure concentration**	**Risk quantification (RCR)**
Fresh water	Local PEC: 5.0E-3 mg/l	0.01
Sedimentation (Fresh water)	Local PEC: 0.025 mg/kg dw	0.01
Marine water	Local PEC: 5.0E-4 mg/l	0.01
Sedimentation (Marine water)	Local PEC: 2.4E-3 mg/kg dw	0.01
Sewage Treatment Plant	Local PEC: 0 mg/l	< 0.01
Agricultural soil	Local PEC: 2.52E-12 mg/kg dw	< 0.01
Man via Environment - Inhalation (Systemic effects)	Concentration in air: 1.62E-21 mg/m³	< 0.01
Man via Environment - Oral	Exposure via food consumption: 1.74E-4 mg/kg bw/day	< 0.01
Man via Environment – Combined routes		< 0.01

3.2. Worker

Contributing scenario controlling worker exposure: Mixing or blending in batch processes (PROC 5)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	3 mg/m³	0.361
Inhalation, Systemic effects, Acute	12 mg/m³	0.146
Dermal, Systemic effects, Long Term	2.83 mg/kg bw/day	0.24
Combined routes, Systemic effects, Long Term		0.601

Contributing scenario controlling worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC 8a)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	2.83 mg/kg bw/day	0.24
Combined routes, Systemic effects, Long Term		0.36

SECTION 4:	**8.5 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

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

Anhang zum erweiterten Sicherheitsdatenblatt (eSDS)

Melamin

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling could be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use, additional RMMs or a site-specific chemical safety assessment is required.

9. Exposure Scenario 9: Service life (worker at industrial site) - Intumescent coatings - Workers (industrial)

SECTION 1:	**Title of exposure scenario**	
	Service life (worker at industrial site) - Intumescent coatings - Workers (industrial)	
Contributing scenario controlling environmental exposure		
CS1	Intumescent coatings - Workers (industrial)	ERC12a
Contributing scenario controlling worker exposure		
CS2	Low energy manipulation of substances bound in materials and/or articles	PROC21
CS3	High (mechanical) energy work-up of substances bound in materials and/or articles	PROC24
Exposure scenario(s) of the uses leading to the inclusion of the substance into the article(s):		
ES6	Use at industrial sites - Use as additive in intumescent coatings	

SECTION 2:	**Conditions of use**
2.1	**Contributing scenario controlling environmental exposure:** 9.1 Intumescent coatings - Workers (industrial) (ERC 12a)
Amount used, frequency and duration of use (or from service life)	
Daily use amount at site: not relevant for the assessment as scenario specific releases are estimated Annual use amount at site: not relevant for the assessment as scenario specific releases are estimated	
Conditions and measures related to biological sewage treatment plant	
Biological STP: Standard [Effectiveness, Water: 0.169%] Discharge rate of STP: >= 2E3 m3/day Application of the STP sludge on agricultural soil: Yes	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow: >= 1.8E4 m3/day	
2.2	**Contributing scenario controlling worker exposure:** 9.2 Low energy manipulation of substances bound in materials and/or articles (PROC 21)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	
2.3	**Contributing scenario controlling worker exposure:** 9.3 High (mechanical) energy work-up of substances bound in materials and/or articles (PROC 24)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	

Technical conditions and measures to control dispersion from source towards the worker
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Advanced Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Operating temperature: <= 40 °C

SECTION 3:	**9.4 Exposure estimation**

3.1. Environment

Release	**Release estimation method**	**Explanations**
Water	Estimated release rate	Local release rate: 0 kg/day
Air	Estimated release rate	Local release rate: 0 kg/day
Non-Agricultural Soil	Estimated release factor	Release factor after on-site RMM: 0%

Protection target	**Exposure concentration**	**Risk quantification (RCR)**
Fresh water	Local PEC: 5.0E-3 mg/l	0.01
Sedimentation (Fresh water)	Local PEC: 0.025 mg/kg dw	0.01
Marine water	Local PEC: 5.0E-4 mg/l	0.01
Sedimentation (Marine water)	Local PEC: 2.4E-3 mg/kg dw	0.01
Sewage Treatment Plant	Local PEC: 0 mg/l	< 0.01
Agricultural soil	Local PEC: 2.52E-12 mg/kg dw	< 0.01
Man via Environment - Inhalation (Systemic effects)	Concentration in air: 1.62E-21 mg/m³	< 0.01
Man via Environment - Oral	Exposure via food consumption: 1.74E-4 mg/kg bw/day	< 0.01
Man via Environment – Combined routes		< 0.01

3.2. Worker

Contributing scenario controlling worker exposure: Low energy manipulation of substances bound in materials and/or articles (PROC 21)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	3 mg/m³	0.361
Inhalation, Systemic effects, Acute	12 mg/m³	0.146
Dermal, Systemic effects, Long Term	2.83 mg/kg bw/day	0.24
Combined routes, Systemic effects, Long Term		0.601

Contributing scenario controlling worker exposure: High (mechanical) energy work-up of substances bound in materials and/or articles (PROC 24)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	1 mg/m³	0.12
Inhalation, Systemic effects, Acute	4 mg/m³	0.049
Dermal, Systemic effects, Long Term	2.83 mg/kg bw/day	0.24
Combined routes, Systemic effects, Long Term		0.36

SECTION 4:	**9.5 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are

managed to at least equivalent levels.
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling could be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use, additional RMMs or a site-specific chemical safety assessment is required.

10. Exposure Scenario 10: Service life (professional worker) - Intumescent coatings - Professional Workers

SECTION 1:	**Title of exposure scenario**	
	Service life (professional worker) - Intumescent coatings - Professional Workers	
Contributing scenario controlling environmental exposure		
CS1	Intumescent coatings - Professional Workers	ERC10a, ERC11a
Contributing scenario controlling worker exposure		
CS2	Low energy manipulation of substances bound in materials and/or articles	PROC21
Exposure scenario(s) of the uses leading to the inclusion of the substance into the article(s):		
ES6	Use at industrial sites - Use as additive in intumescent coatings	
ES7	Widespread use by professional workers - Use as additive in intumescent coatings	

SECTION 2:	**Conditions of use**
2.1	**Contributing scenario controlling environmental exposure:** 10.1 Intumescent coatings - Professional Workers (ERC 10a, ERC 11a)
Amount used, frequency and duration of use (or from service life)	
Daily local widespread use amount: not relevant for the assessment as scenario specific releases are estimated	
Conditions and measures related to biological sewage treatment plant	
Biological STP: Standard [Effectiveness, Water: 0.169%] Discharge rate of STP: >= 2E3 m3/day Application of the STP sludge on agricultural soil: Yes	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow: >= 1.8E4 m3/day	
2.2	**Contributing scenario controlling worker exposure:** 10.2 Low energy manipulation of substances bound in materials and/or articles (PROC 21)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 100 % Physical form of the used product: Solid (medium dusty form)	
Frequency and duration of use	
Duration of activity: <= 8 h/day	
Technical conditions and measures to control dispersion from source towards the worker	
General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness, Inhalation: 0%] Occupational Health and Safety Management System: Basic Local exhaust ventilation: No [Effectiveness, Inhalation: 0%, Dermal: 0%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No [Effectiveness, Inhalation: 0%] Dermal protection: No [Effectiveness, Dermal: 0%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Operating temperature: <= 40 °C	

SECTION 3:	**10.3 Exposure estimation**
3.1. Environment	

Release	**Release estimation method**	**Explanations**
Water	Estimated release rate	Local release rate: 0 kg/day
Air	Estimated release rate	Local release rate: 0 kg/day
Non-Agricultural Soil	Estimated release factor	Release factor after on-site RMM: 0%

Protection target	**Exposure concentration**	**Risk quantification (RCR)**

Fresh water	Local PEC: 5.0E-3 mg/l	0.01
Sedimentation (Fresh water)	Local PEC: 0.025 mg/kg dw	0.01
Marine water	Local PEC: 5.0E-4 mg/l	0.01
Sedimentation (Marine water)	Local PEC: 2.4E-3 mg/kg dw	0.01
Sewage Treatment Plant	Local PEC: 0 mg/l	< 0.01
Agricultural soil	Local PEC: 2.52E-12 mg/kg dw	< 0.01
Man via Environment - Inhalation (Systemic effects)	Concentration in air: 1.62E-21 mg/m³	< 0.01
Man via Environment - Oral	Exposure via food consumption: 1.74E-4 mg/kg bw/day	< 0.01
Man via Environment – Combined routes		< 0.01

3.2. Worker

Contributing scenario controlling worker exposure: Low energy manipulation of substances bound in materials and/or articles (PROC 21)

Exposure route	**Exposure estimate - Worker**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	5 mg/m³	0.602
Inhalation, Systemic effects, Acute	20 mg/m³	0.243
Dermal, Systemic effects, Long Term	2.83 mg/kg bw/day	0.24
Combined routes, Systemic effects, Long Term		0.842

SECTION 4:	**10.4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling could be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use, additional RMMs or a site-specific chemical safety assessment is required.

11. Exposure Scenario 11: Service life (consumers) - PU foams – Consumers

SECTION 1:	**Title of exposure scenario**	
	Service life (consumers) - PU foams – Consumers	
Contributing scenario controlling environmental exposure		
CS1	PU foams – Consumers	ERC10a, ERC11a
Contributing scenario controlling worker exposure		
CS2	Use of articles containing foam with encapsulated the substance	AC1, AC1a, AC 13, AC 13e
Exposure scenario(s) of the uses leading to the inclusion of the substance into the article(s):		
ES5	Use at industrial sites - Use as additive in foams	
SECTION 2:	**Conditions of use**	
2.1	**Contributing scenario controlling environmental exposure:** 11.1 PU foams – Consumers (ERC 10a, ERC 11a)	
Amount used, frequency and duration of use (or from service life)		
Daily local widespread use amount: not relevant for the assessment as scenario specific releases are estimated		
Conditions and measures related to biological sewage treatment plant		
Biological STP: Standard [Effectiveness, Water: 0.169%] Discharge rate of STP: >= 2E3 m3/day Application of the STP sludge on agricultural soil: Yes		
Other given operational conditions affecting environmental exposure		
Receiving surface water flow: >= 1.8E4 m3/day		
2.2	**Contributing scenario controlling consumer exposure:** 11.2 Use of articles containing foam with encapsulated the substance (AC1, AC1a, AC 13, AC13e)	
Product characteristics		
Percentage (w/w) of substance in mixture/article: <= 30 % Exposure via inhalation route: Inhalation exposure is considered to be not relevant Exposure via oral route: Oral exposure is considered to be not relevant		

SECTION 3:	**11.3 Exposure estimation**
3.1. Environment	

Release	**Release estimation method**	**Explanations**
Water	Estimated release rate	Local release rate: 0 kg/day
Air	Estimated release rate	Local release rate: 0 kg/day
Non-Agricultural Soil	Estimated release factor	Release factor after on-site RMM: 0%

Protection target	**Exposure concentration**	**Risk quantification (RCR)**
Fresh water	Local PEC: 5.0E-3 mg/l	0.01
Sedimentation (Fresh water)	Local PEC: 0.025 mg/kg dw	0.01
Marine water	Local PEC: 5.0E-4 mg/l	0.01
Sedimentation (Marine water)	Local PEC: 2.4E-3 mg/kg dw	0.01
Sewage Treatment Plant	Local PEC: 0 mg/l	< 0.01
Agricultural soil	Local PEC: 2.52E-12 mg/kg dw	< 0.01
Man via Environment - Inhalation (Systemic effects)	Concentration in air: 1.62E-21 mg/m³	< 0.01
Man via Environment - Oral	Exposure via food consumption: 1.74E-4 mg/kg bw/day	< 0.01
Man via Environment – Combined routes		< 0.01

3.2. Consumer		
Contributing scenario controlling consumer exposure: Use of articles containing foam with encapsulated the substance (AC1, AC1a, AC 13, AC13e)		
Exposure route	**Exposure estimate - Consumer**	**Risk quantification (RCR)**
Inhalation, Systemic effects, Long Term	Negligible (Migration study)	< 0.01
Dermal, Systemic effects, Long Term	0.1484 mg/kg bw/day: for a baby, when using additional sheets for mattress protection and comfort (Migration study) 0.06375 mg/kg bw/day: for an adult, when using additional sheets for mattress protection and comfort (Migration study) 0.6375 mg/kg bw/day: for an adult, when sleeping directly on the mattress cover (Migration study) 1.484 mg/kg bw/day: for a baby, when sleeping directly on the mattress cover (Migration study)	0.035 0.015
Oral, Systemic effects, Long Term	Negligible (Migration study)	< 0.01
Combined routes, Systemic effects, Long Term		0.035 for a baby 0.015 for an adult

SECTION 4:	**11.4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

Remarks on exposure data:
Migration study:
Explanation: The substance is used in foam mattresses, as a non-halogenated flame retardant. The European association of flexible polyurethane foam blocks manufacturers (EUROPUR) commissioned a migration study, to evaluate the potential exposure of humans from melamine used in flexible PU foam used in mattresses. The study was submitted to ECHA by EUROPUR, as part of their response to the public consultation on the CLH report for melamine dated November 2019 and can be found on the ECHA website.
Based on the vapour pressure of the substance and since mattresses are flat and not mouthed, inhalation and oral exposure are considered negligible, while potential dermal exposure is deemed the most relevant route of exposure due to the prolonged contact duration, with a large part of the body and the possible effect of sweat as a vehicle.
The migration of melamine into synthetic sweat soaked filter papers from these foams was investigated. As a mattress typically consists of a PUR foam core surrounded with a fabric layer, migration was investigated with and without the use of a polyester-polypropylene mattress cover placed between the foam and filter paper. The set-up was compressed to 70% of its depth in order to simulate a person sleeping on the mattress and incubated at 40°C for 2 hours.
When the foam was covered, a standard practice for every mattress with flexible PU foam, the migration was below the limit of detection (LOD) and LOD/2 was used as estimate for people sleeping directly on the mattress cover (0.6375 mg/kg bw/day for an adult and 1.484 for a baby). Note that this is a worst-case assessment as usually people don't sleep directly on the mattress cover but put additional sheets for additional mattress protection and comfort. When refined due to the use of additional sheets for mattress protection and comfort, the dermal exposure estimates were concluded to be 0.06375 for an adult and 0.1484 for a baby. Note that no melamine was detected when the mattress cover was included in the test set-up and that the calculations are therefore done based on the LOD/2.

12. Exposure Scenario 12: Service life (consumers) - Intumescent coating – Consumers

SECTION 1:	**Title of exposure scenario**	
	Service life (consumers) - Intumescent coating – Consumers	
Contributing scenario controlling environmental exposure		
CS1	Intumescent coating – Consumers	ERC10a, ERC11a
Contributing scenario controlling worker exposure		
CS2	Use of articles with intumescent coating with encapsulated the substance	AC13
Exposure scenario(s) of the uses leading to the inclusion of the substance into the article(s):		
ES6	Use at industrial sites - Use as additive in intumescent coatings	
ES7	Widespread use by professional workers - Use as additive in intumescent coatings	

SECTION 2:	**Conditions of use**
2.1	**Contributing scenario controlling environmental exposure:** 12.1 Intumescent coating – Consumers (ERC 10a, ERC 11a)
Amount used, frequency and duration of use (or from service life)	
Daily local widespread use amount: not relevant for the assessment as scenario specific releases are estimated	
Conditions and measures related to biological sewage treatment plant	
Biological STP: Standard [Effectiveness, Water: 0.169%] Discharge rate of STP: >= 2E3 m3/day Application of the STP sludge on agricultural soil: Yes	
Other given operational conditions affecting environmental exposure	
Receiving surface water flow: >= 1.8E4 m3/day	
2.2	**Contributing scenario controlling consumer exposure:** 12.2 Use of articles with intumescent coating with encapsulated the substance (AC 13)
Product characteristics	
Percentage (w/w) of substance in mixture/article: <= 30 % Exposure via inhalation route: Inhalation exposure is considered to be not relevant Exposure via dermal route: Dermal exposure assumed to be negligible Exposure via oral route: Oral exposure is considered to be not relevant	

SECTION 3:	**12.3 Exposure estimation**
3.1. Environment	

Release	**Release estimation method**	**Explanations**
Water	Estimated release rate	Local release rate: 0 kg/day
Air	Estimated release rate	Local release rate: 0 kg/day
Non-Agricultural Soil	Estimated release factor	Release factor after on-site RMM: 0%

Protection target	**Exposure concentration**	**Risk quantification (RCR)**
Fresh water	Local PEC: 5.0E-3 mg/l	0.01
Sedimentation (Fresh water)	Local PEC: 0.025 mg/kg dw	0.01
Marine water	Local PEC: 5.0E-4 mg/l	0.01
Sedimentation (Marine water)	Local PEC: 2.4E-3 mg/kg dw	0.01
Sewage Treatment Plant	Local PEC: 0 mg/l	< 0.01
Agricultural soil	Local PEC: 2.52E-12 mg/kg dw	< 0.01
Man via Environment - Inhalation (Systemic effects)	Concentration in air: 1.62E-21 mg/m³	< 0.01
Man via Environment - Oral	Exposure via food consumption: 1.74E-4 mg/kg bw/day	< 0.01
Man via Environment – Combined routes		< 0.01

3.2 Consumer	
Contributing scenario controlling consumer exposure: Use of articles with intumescent coating with encapsulated the substance (AC 13)	
As any (dermal) contact by consumers with these coatings will be incidental and as the substance is embedded in a matrix, inhalation, dermal and oral exposure (and therefore risks) are considered to be negligible.	
SECTION 4:	**12.4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling could be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use, additional RMMs or a site-specific chemical safety assessment is required.	