FICHE DE DONNÉES DE SÉCURITÉ

CONFORMÉMENT AUX RÈGLEMENTS CE 1907/2006
(REACH), 1272/2008 (CLP) et 2015/830

Date d'impression : 06.10.2020 | Version n° : 8 | Révision : 06.10.2020

SECTION 1 : IDENTIFICATION DE LA SUBSTANCE/DU MÉLANGE ET DE LA SOCIÉTÉ/ENTREPRISE

1.1 Identificateur de produit

Nom du produit	Mélamine
Nom chimique	1,3,5-Triazine-2,4,6-triamine
Formule chimique	$C_3H_6N_6$
No CAS	108-78-1
No CE	203-615-4
No d'enregistrement REACH	01-2119485947-16-0017

1.2 Utilisations identifiées pertinentes de la substance ou du mélange et utilisations déconseillées

Utilisation(s) identifiée(s)

La mélamine ($C_3H_6N_6$) est un produit sous forme de poudre blanche utilisé pour la production d'une large gamme de résines synthétiques.

- Formulation ou reconditionnement
- Utilisation comme intermédiaire pour les résines (mélamine réagie)
- Utilisation comme additif dans les mousses
- Utilisation comme additif dans les revêtements intumescents
- Mousses PU - Travailleurs (industrie)
- Revêtements intumescents - Travailleurs (industrie)
- Revêtements intumescents - Travailleurs professionnels

Utilisations déconseillées: Ajout dans les aliments pour animaux ou les produits alimentaires.

1.3 Renseignements concernant le fournisseur de la fiche de données de sécurité

Identification de la société	Qatar Melamine Co
Adresse	P.O. Box 50001, Mesaieed, Qatar.
Téléphone	+974 - 44228888
Courrier électronique	mktg@qafco.com.qa

Représentant exclusif d'un fabricant non communautaire

Identification de la société	MUNTAJAT B.V.
Adresse	Prinses Margrietplantsoen 78-A 2595 BR, La Haye Pays-Bas
Téléphone	+31(0)70 219 7000
Courrier électronique	REACH@muntajatbv.com
Site Web	www.muntajatbv.com

1.4 Numéro d'appel d'urgence

National Poisons Information Service (Birmingham Centre)	+44 (0) 111
Pour les déversements, les fuites, les incendies, les expositions ou les accidents, appeler CHEMTREC Jour ou Nuit	Aux États-Unis et au Canada : 1-800-424-9300 En dehors des États-Unis et du Canada : +1 703-741-5970 et +1-703-527-3887 (appels en PCV acceptés)

SECTION 2 : IDENTIFICATION DES DANGERS

2.1 Classification de la substance ou du mélange

Règlement (CE) no 1272/2008 (CLP): Repr. 2:suspecté de nuire à la fertilité

2.2 Éléments d'étiquetage

Conformément au règlement (CE) no 1272/2008 (CLP)

Nom du produit: Mélamine

Pictogramme(s) de danger

GHS08

Mot(s) de signalisation: Avertissement

Mention(s) de danger: H361f : Suspecté de nuire à la fertilité

Mention(s) de précaution:
P201 : Obtenir des instructions spéciales avant d'utiliser.
P202 : Ne pas manipuler tant que toutes les précautions de sécurité n'ont pas été lues et comprises.
P280 : Porter des gants de protection/des vêtements de protection/protection des yeux/protection du visage.
P308+P313 : En cas d'exposition ou de doute : Obtenir des conseils et des soins médicaux.
P405 : Magasin clos.
P501 : Éliminer les contenus conformément à la législation locale, étatique ou nationale.

2.3 Autres dangers

Peut être nocif en cas d'ingestion
La poussière peut avoir un effet irritant sur la peau, les yeux et les voies respiratoires

2,4 Informations complémentaires

Aucune.

SECTION 3 : COMPOSITION/INFORMATIONS SUR LES COMPOSANTS

3.1 Substances

INGRÉDIENT(S) DANGEREUX	No CAS	No CE	%W/W	Mention(s) de danger	Pictogramme(s) de danger
Mélamine	108-78-1	203-615-4 01-2119485947-16-0017	≥ 99	Repr. 2 H361f	GHS08

3.2 Mélanges

Non applicable.

SECTION 4 : PREMIERS SECOURS

4.1 Description des premiers secours

Inhalation: Si la respiration est difficile, emmener la victime à l'air frais et la maintenir au repos dans une position confortable pour respirer. Si les symptômes persistent, obtenir des soins médicaux.

Contact avec la peau: Après contact avec la peau, laver immédiatement avec beaucoup de savon et d'eau.

Contact avec les yeux: Rincer d'abord avec beaucoup d'eau pendant plusieurs minutes (retirer les lentilles de contact si possible), puis consulter un médecin.

Ingestion: En cas d'ingestion, rincer la bouche avec de l'eau (seulement si la personne est consciente).

4.2 Principaux symptômes et effets, aigus et retardés

La poussière peut avoir un effet irritant sur la peau, les yeux et les voies respiratoires

4.3 Indication des éventuels soins médicaux immédiats et traitements particuliers nécessaires

En cas d'exposition ou de doute : Obtenir des conseils et des soins médicaux.

SECTION 5 : MESURES DE PROTECTION INCENDIE

5.1 Moyens d'extinction

Support d'extinction approprié: Extinction avec du dioxyde de carbone, des produits chimiques secs, des mousses ou de vaporisation d'eau.

Moyens d'extinction inadaptés: Eau avec pulvérisation en cône plein

5.2 Dangers particuliers résultant de la substance ou du mélange

Se décompose dans un incendie dégageant des fumées toxiques : Monoxyde de carbone, dioxyde de carbone, oxydes d'azote. La mélamine libère de l'ammoniac lorsqu'elle est chauffée au-delà de 500 °C.

5.3 Avis aux pompiers

Les pompiers devraient porter des vêtements de protection complets, y compris des appareils respiratoires autonomes.

SECTION 6 : MESURES À PRENDRE EN CAS DE REJET ACCIDENTEL

6.1 Précautions individuelles, équipement de protection et procédures d'urgence

Veiller à bien ventiler les lieux. Assurer une protection personnelle adéquate (y compris une protection respiratoire) lors de l'enlèvement des déversements. Éviter la production de poussière. Éviter de respirer de la poussière.

6.2 Précautions pour la protection de l'environnement

Ne pas rejeter dans les égouts ou les eaux superficielles/souterraines.

6.3 Méthodes et matériel de confinement et de nettoyage

Balayer les substances déversées dans des contenants, s'il y a lieu, humidifier d'abord afin d'éviter la poussière. Rassembler soigneusement les restes. Ne pas laver le déversement avec de l'eau, car la zone sera glissante et bouchera les eaux usées.

6.4 Référence à d'autres sections

Voir également la section 8, 13.

SECTION 7 : MANIPULATION ET STOCKAGE

7.1 Précautions à prendre pour une manipulation sûre

Obtenir des instructions spéciales avant d'utiliser. Ne pas manipuler tant que toutes les précautions de sécurité n'ont pas été lues et comprises. Assurer une ventilation adéquate. Éviter la production de poussière. Éviter de respirer de la poussière. Porter des gants de protection/des vêtements de protection/protection des yeux/protection du visage. Laver les mains et la peau exposée soigneusement après la manipulation.

7.2 Conditions d'un stockage sûr, y compris d'éventuelles incompatibilités

Conserver à l'abri de la lumière directe du soleil. Magasin clos. Stocker à sec. Garder le conteneur bien fermé.

Température de stockage: Ambiante.
Durée de vie du stockage: Stable dans des conditions normales.
Matériaux incompatibles: Fortement acide. Agents oxydants forts.

7.3 Utilisation(s) finale(s) spécifique(s)

- Formulation ou reconditionnement
- Utilisation comme intermédiaire pour les résines (mélamine réagie)
- Utilisation comme additif dans les mousses
- Utilisation comme additif dans les revêtements intumescents
- Mousses PU - Travailleurs (industrie)
- Revêtements intumescents - Travailleurs (industrie)
- Revêtements intumescents - Travailleurs professionnels

SECTION 8 : CONTRÔLES DE L'EXPOSITION/PROTECTION INDIVIDUELLE

8.1 Paramètres de contrôle

8.1.1 Limites d'exposition professionnelle

SUBSTANCE	No CAS	LTEL (8 h TWA ppm)	LTEL (8 h TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
Mélamine	108-78-1					Aucune affectation

Source: Limites d'exposition sur le lieu de travail au Royaume-Uni EH40/2005 (quatrième édition, publiée en 2020), Royaume-Uni

8.1.2 Valeur limite biologique: Non établi.

8.1.3 PNECs et DNELs

DNEL / DMEL	Par voie orale	Inhalation	Cutanée
Industrie - À long terme - Effets locaux			
Industrie - À long terme - Effets systémiques		8.3 mg/m³	11,8 mg/kg p.c./jour

Industrie - À court terme - Effets locaux			
Industrie - À court terme - Effets systémiques		82,3 mg/m³	117 mg/kg p.c./jour
Consommateurs - à long terme - effets locaux			
Consommateurs - à long terme - effets systémiques	0,42 mg/kg p.c./jour	1,5 mg/m³	4,2 mg/kg p.c./jour
Consommateurs - À court terme - Effets locaux			
Consommateurs - À court terme - Effets systémiques			

Environnement	PNEC
Compartiment aquatique (y compris les sédiments)	Eau douce: 0,51 mg/l Libération intermittente: 2 mg/l Eau de mer: 0,051 mg/l Eau douce (sédiments) : 2,524 mg/kg p.c. Eau de mer (sédiments) : 0,252 mg/kg p.c.
Compartiment terrestre	Usine de traitement des eaux usées: 200 mg/l
Compartiment atmosphérique	Sol : 0,206 mg/kg p.c.

8.2 Contrôles de l'exposition

8.2.1 Contrôles techniques appropriés — Veiller à bien ventiler les lieux.

8.2.2 Équipement de protection individuelle

Protection des yeux — Porter des lunettes de protection (lunettes de protection, écran facial ou lunettes de sécurité)

Protection de la peau — Porter des gants de protection.
Temps de rupture du matériau gant : se référer aux informations fournies par le producteur de gants.

Équipement de protection respiratoire — Un masque anti-poussière approuvé doit être porté si de la poussière est générée lors de la manipulation

Risques thermiques — Non applicable.

8.2.3 Contrôles de l'exposition environnementale — Ne pas rejeter dans les égouts ou les eaux superficielles/souterraines.

SECTION 9 : PROPRIÉTÉS PHYSIQUES ET CHIMIQUES

9.1 Informations sur les propriétés physiques et chimiques essentielles

Aspect	Poudre. Couleur : Blanc.
Odeur	Inodore
Seuil odeur	Non établi.
pH	7,5-8,5 (solution aqueuse), 20 g/l @ 20°C
Point de fusion/point de congélation	354°C (Ne gèle pas, solidifie)
Point d'ébullition initial et plage d'ébullition	>354°C (Sublimation)
Point Flash	Non applicable.
Taux d'évaporation	Non applicable.
Inflammabilité (solide, gaz)	Ininflammable.
Limites supérieures/inférieures d'inflammabilité ou d'explosibilité	Non disponible.
Pression de vapeur	4,7 x 1,0 E-8 Pa @ 20°C
Densité de vapeur	Non applicable.
Densité (g/ml)	1 570 kg/m³
Densité relative	1.57
Solubilité(s)	Solubilité (Eau) : Légèrement soluble : 3,48 g/l @ 20°C Solubilité (Autre): Très légèrement soluble : Acétone (0,3 g/l), éthanol (0,6 g/l), diméthylformamide (0,1 g/l), soluble: Cellosolution d'éthyle (11,2 g/l) @ 30°C
Coefficient de partage : (n-octanol/eau)	-1,22 @ 20°C
Température d'auto-inflammation	>500°C
Température de décomposition (°C)	>354°C
Viscosité	Non applicable.
Propriétés explosives	Non explosif.
Propriétés d'oxydation	Non oxydant

9.2 Autres informations

Constante de dissociation — 6,7 pKa @ 20°C

Poids moléculaire 126,12 g/mol

SECTION 10 : STABILITÉ ET RÉACTIVITÉ

10.1 Réactivité

Stable dans des conditions normales.

10.2 Stabilité chimique

Stable dans des conditions normales.

10.3 Possibilité de réactions dangereuses

Aucune réaction dangereuse connue en cas d'utilisation conforme à sa destination

10.4 Conditions à éviter

Conserver à l'abri de l'humidité.

10.5 Matériaux incompatibles

Fortement acide. Agents oxydants forts.

10.6 Produits de décomposition dangereux

Aucun produit de décomposition dangereux connu.

SECTION 11 : INFORMATIONS TOXICOLOGIQUES

11.1 Informations sur les effets toxicologiques

Toxicité aiguë - Ingestion	Peut être nocif en cas d'ingestion LD50 (rat): 3161 mg/kg
Toxicité aiguë - Contact avec la peau	Faible toxicité aiguë.
Toxicité aiguë - Inhalation	Faible toxicité aiguë. LC50 (rat): >5 190 mg/m³
corrosion/irritation de la peau	Non classé.
Lésions oculaires graves/irritation	Non classé.
Données de sensibilisation cutanée	Ce n'est pas un sensibilisateur cutané
Données de sensibilisation respiratoire	Non classé.
Mutagénicité des cellules germinales	Il n'existe aucune preuve de potentiel mutagène.
Cancérogénicité	Non classifiable quant à sa cancérogénicité pour les humains. LOAEL (oral): 126 mg/kg p.c./jour (chronique, rat, vessie). Des augmentations statistiquement significatives de l'incidence du carcinome des cellules de transition et de l'incidence combinée du carcinome des cellules de transition et du papillome dans la vessie urinaire ont été observées chez des rats mâles exposés à 4 500 ppm de mélamine (environ 263 mg/kg p.c./jour), mais pas lorsqu'ils sont exposés à 2 250 ppm de mélamine. À une exception près, des calculs urinaires ont été observés chez des rats mâles atteints de carcinomes à cellules transitoires. Les rats femelles n'ont pas développé de tumeurs, même lorsqu'elles ont été soumises à une exposition pouvant atteindre 9 000 ppm. Aucune découverte néoplastique liée au traitement n'a été observée chez les souris mâles ou femelles. Non démontré pour les humains.
Toxicité reproductive	Suspecté d'endommager la fertilité chez les rats mâles. NOAEL (oral): 89 mg/kg pc/jour (subchronique, 168 heures/semaine rat). Des effets indésirables sur le système reproducteur mâle ont été détectés dans un EOGRTS effectué selon le TG 443 de l'OCDE chez des rats, à la suite de la décision TPE-D-2114373433-50-01 de l'ECHA. On a observé une dégénérescence/atrophie tubulaire dans les testicules avec des débris cellulaires minimaux apparentés dans l'épididyme chez les mâles F0 et F1. De plus, on a observé une augmentation des anomalies du sperme (têtes détachées) chez les mâles F0 et F1.
Lactation	Aucune prévue
STOT - exposition unique	Non classé.
STOT - exposition répétée	Non classé.
Risque d'aspiration	Aucun prévu

11.2 Autres informations

La poussière peut avoir un effet irritant sur la peau, les yeux et les voies respiratoires

SECTION 12 : INFORMATIONS ÉCOLOGIQUES

12.1 Toxicité

Faible toxicité pour les organismes aquatiques.

Aigu	LC50 (Daphnia magna): 200 mg/l
Chronique	NOEC (tête de méné (Pimephales promelas)): 5,1 mg/l
	NOEC (Daphnia magna): 11 mg/l
Algues	EC50 Eau douce : 325 mg/l
	CSEO Eau douce : 98 mg/l

12.2 Persistance et dégradabilité

Cette substance n'est pas facilement biodégradable. Ne devrait pas être intrinsèquement biodégradable

12.3 Potentiel de bioaccumulation

La substance n'a aucun potentiel de bioaccumulation.
Facteur de bioconcentration (FBC) : 3,8 L/kg poids humide

12.4 Mobilité dans le sol

On prévoit une mobilité modérée de la substance dans le sol.

12.5 Résultats des évaluations PBT et vPvB

Non classé comme PBT ou vPvB.

12.6 Autres effets néfastes

Inconnu.

SECTION 13 : CONSIDÉRATIONS RELATIVES À L'ÉLIMINATION

13.1 Méthodes de traitement des déchets

Éliminer de manière sûre les conteneurs vides et les déchets. Récupérer ou recycler si possible.

13.2 Informations complémentaires

L'élimination doit être conforme à la législation locale, étatique ou nationale.

SECTION 14 : INFORMATIONS RELATIVES AU TRANSPORT

Non classé comme dangereux pour le transport.

14.1 Numéro UN

Non applicable.

14.2 Nom d'expédition caractéristique UN

Non applicable.

14.3 Classe(s) de danger pour le transport

Non applicable.

14.4 Groupe d'emballage

Non applicable.

14.5 Dangers environnementaux

Non classé comme polluant marin.

14.6 Précautions spéciales pour l'utilisateur

Inconnu

14.7 Transport en vrac conformément à l'annexe II Marpol et au code CIB

Inconnu

SECTION 15 : INFORMATIONS RELATIVES À LA RÉGLEMENTATION

15.1 Réglementations/législation particulières à la substance ou au mélange en matière de sécurité, de santé et d'environnement

Règlement européen - Autorisations et/ou restrictions d'utilisation

Liste candidate des substances extrêmement sensibles pour l'autorisation	Non répertorié
REACH : ANNEXE XIV Liste des substances soumises à autorisation	Non répertorié
REACH : Annexe XVII Restrictions à la fabrication, à la mise sur le marché et à l'utilisation de certaines substances, mélanges et articles dangereux	Non répertorié
Plan d'action communautaire (CoRAP)	Non répertorié
Règlement (CE) no 850/2004 du Parlement européen et du Conseil relatif aux polluants organiques persistants	Non répertorié
Règlement (CE) n° 1005/2009 relatif à des substances qui réduisent la couche d'ozone	Non répertorié
Règlement (UE) no 649/2012 du Parlement européen et du Conseil concernant l'exportation et l'importation de produits chimiques dangereux	Non répertorié

Réglementations nationales

État de l'inventaire	Répertorié en : Australie, Canada (DSL), Chine, Japon, Corée, Taïwan, Nouvelle-Zélande (HSNO) - Approbation HSNO : HSR002503, Nouvelle-Zélande (NZIoC), Philippines.

15.2 Évaluation de la sécurité chimique

Une évaluation de la sécurité chimique REACH a été effectuée.

SECTION 16 : AUTRES INFORMATIONS

Les sections suivantes contiennent des révisions ou de nouvelles instructions	1-16

LÉGENDE

Pictogramme(s) de danger

GHS08

Classification des dangers	Repr. 2 : Toxicité pour la reproduction, catégorie 2
Mention(s) de danger	H361f : Suspecté de nuire à la fertilité
Mention(s) de précaution	P201 : Obtenir des instructions spéciales avant d'utiliser. P202 : Ne pas manipuler tant que toutes les précautions de sécurité n'ont pas été lues et comprises. P280 : Porter des gants de protection/des vêtements de protection/protection des yeux/protection du visage. P308+P313 : En cas d'exposition ou de doute : Obtenir des conseils et des soins médicaux. P405 : Magasin clos. P501 : Éliminer les contenus conformément à la législation locale, étatique ou nationale.
Acronymes	CAS : Chemical Abstracts Service CLP : Règlement (CE) no 1272/2008 relatif à la classification, à l'étiquetage et à l'emballage des substances et des mélanges

DNEL : Niveau d'effet dérivé
CE : Communauté européenne
LTEL : Limite d'exposition à long terme
PBT : Persistant, bioaccumulable et toxique
PNEC : Concentration sans effet prédit
REACH : Règlement REACH (enregistrement, évaluation, autorisation et restriction des substances chimiques)
STEL : Limite d'exposition à court terme
STOT : Toxicité spécifique pour l'organe cible
vPvB : très persistant et très bioaccumulable

Avertissements

Les informations contenues dans cette publication ou autrement fournies aux Utilisateurs sont considérées comme exactes et sont données de bonne foi, mais il appartient aux Utilisateurs de s'assurer de l'adéquation du produit à leur propre usage.
Qatar Melamine Co ne donne aucune garantie quant à l'aptitude du produit à un usage particulier et toute garantie ou condition implicite (légale ou autre) est exclue, sauf dans la mesure où l'exclusion est empêchée par la loi.
Qatar Melamine Co n'accepte aucune responsabilité pour les pertes ou les dommages (autres que ceux résultant d'un décès ou d'une blessure corporelle causés par un produit défectueux, si cela est démontré), résultant de la confiance accordée à ces informations. La liberté en matière de brevets, de droits d'auteur et de dessins et modèles ne peut être présumée

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Contributing scenario controlling worker exposure		
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CS3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions	PROC3
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CS12	Manual maintenance (cleaning and repair) of machinery	PROC28

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.

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.	