Δελτίου δεδομένων ασφαλείας
θείο
Δελτίου δεδομένων ασφαλείας του/της 30/4/2021 επιθεώρηση 18

ΤΜΗΜΑ 1: Αναγνωριστικός κωδικός ουσίας/μείγματος και εταιρείας/επιχείρησης

1.1. Αναγνωριστικός κωδικός προϊόντος

Αναγνώριση της ουσίας:

Όνομα εμπορίου: SOLID SULPHUR, SULPHUR PASTILS, SLATES, FLAKES
×çìéêÞ ïíïìáóßá: θείο
Αριθμός CAS: 7704-34-9
Αριθμός EC: 231-722-6
Αριθμός Index: 016-094-00-1
Αριθμός καταχώρησης 01-2119487295-27-XXXX

1.2. Συναφείς προσδιοριζόμενες χρήσεις της ουσίας ή του μείγματος και αντενδεικνυόμενες χρήσεις

Προτεινόμενη χρήση: ΒΙΟΜΗΧΑΝΙΚΗ ΧΡΗΣΗ; ΛΙΠΑΣΜΑ; ΕΠΑΓΓΕΛΜΑΤΙΚΗ ΧΡΗΣΗ; Δείτε το σενάριο έκθεσης στο παράρτημα.
Μη προτεινόμενες χρήσεις: N.A.

1.3. Στοιχεία του προμηθευτή του δελτίου δεδομένων ασφαλείας

Προμηθευτής:

ZOLFINDUSTRIA S.r.l. Via San Cassiano 99
28069 - Trecate (NO)
ITALY
Phone: +39-0321-7901

Ικανός υποκείμενο, αίτιοσ δελτιο ασφαλειας: msds@zolfindustria.it

1.4. Αριθμός τηλεφώνου επείγουσας ανάγκης

Zolfindustria - Phone n. +39-0321-7901
Ελλάδα - Τηλέφωνο Έκτακτης Ανάγκης Κέντρο Δηλητηριάσεων Νοσ. Παίδων Αγλαΐα Κυριακού 0030 210 7793777
Κύπρος - Αριθμός κέντρου δηλητηριάσεων της Κύπρου: 1401

ΤΜΗΜΑ 2: Προσδιορισμός επικινδυνότητας

2.1. Ταξινόμηση της ουσίας ή του μείγματος

Κανονισμός (ΕΚ) αριθ. 1272/2008 (CLP)

Skin Irrit. 2 Προκαλεί ερεθισμό του δέρματος

Δυσμενείς φυσικοχημικές, περιβαλλοντικές επιπτώσεις και επιπτώσεις στην ανθρώπινη υγεία.

Κανένας άλλος κίνδυνος

2.2. Στοιχεία επισήμανσης

Κανονισμός (ΕΚ) αριθ. 1272/2008 (CLP)

Εικονογράμματα και Προειδοποιητική λέξη

Προσοχή

Δηλώσεις επικινδυνότητας

H315 Προκαλεί ερεθισμό του δέρματος

Δηλώσεις προφυλάξεων

P280 Φορέστε γάντια/προστατευτικά ενδύματα.
P302+P352 ΣΕ ΠΕΡΙΠΤΩΣΗ ΕΠΑΦΗΣ ΜΕ ΤΟ ΔΕΡΜΑ: Πλύντε με άφθονο νερό.
P362+P364 Βγάλτε τα μολυσμένα ρούχα και πλύντε τα πριν τα ξαναχρησιμοποιήσετε.

Ειδικές διατάξεις σύμφωνα με το Παράρτημα XVII του REACH και μεταγενέστερες τροποποιήσεις:

Καμία

2.3. Άλλοι κίνδυνοι

Δεν υπάρχουν εξαρτήματα ΑΒΤ/vPvB.

Άλλοι Κίνδυνοι: Κανένας άλλος κίνδυνος

ΤΜΗΜΑ 3: Σύνθεση/πληροφορίες για τα συστατικά

3.1. Ουσίες

Αναγνωρίσεις Ουσίας:	θείο
Αριθμός CAS:	7704-34-9
Αριθμός EC:	231-722-6
Αριθμός Index:	016-094-00-1
Αριθμός καταχώρησης	01-2119487295-27-XXXX

3.2. Μείγματα

N.A.

ΤΜΗΜΑ 4: Μέτρα πρώτων βοηθειών

4.1. Περιγραφή των μέτρων πρώτων βοηθειών

Σε περίπτωση επαφής με το δέρμα:

Βγάζετε αμέσως από πάνω σας τα μολυσμένα ενδύματα.

Αφαιρέστε τα μολυσμένα ρούχα αμέσως και πετάξτε τα με ασφάλεια.

Ύστερα από επαφή με το δέρμα, πλύντε αμέσως με σαπούνι και άφθονο νερό.

In case of persistent skin irritation consult a doctor.

Σε περίπτωση επαφής με τα μάτια:

Ξεπλύνετε τα μάτια με άφθονη ποσότητα νερού για τουλάχιστον 10-15 λεπτά , κρατώντας ανοικτά τα βλέφαρα για να εξασφαλίσετε ότι έχουν ξεπλυθεί πλήρως.

Προστατέψτε το μη τραυματισμένο μάτι.

Ζητήστε ιατρική βοήθεια

Εάν εμφανιστεί ερεθισμός, θολή όραση ή οίδημα και επιμείνει, συμβουλευθείτε έναν ειδικό ιατρό.

Σε περίπτωση Δυσπεψίας:

Μην προκαλείτε εμετό. Λάβετε ιατρική βοήθεια και δείξτε το SDS και την ετικέτα κινδύνου,

Σε περίπτωση Εισπνοής:

Μετακινήστε τον τραυματία στον καθαρό αέρα και κρατήστε τον ζεστό και σε ξεκούραστη θέση.

4.2. Σημαντικότερα συμπτώματα και επιδράσεις, άμεσες ή μεταγενέστερες

Ερεθισμός ματιού

Βλάβες στο μάτι

Ερεθισμός Δέρματος

Ερύθημα

4.3. Ένδειξη οποιασδήποτε απαιτούμενης άμεσης ιατρικής φροντίδας και ειδικής θεραπείας

Σε περίπτωση ατυχήματος ή αδιαθεσίας, αναζητήστε ιατρική συμβουλή αμέσως (δείξτε τις οδηγίες χρήσης ή το φύλλο δεδομένων ασφαλείας, αν είναι δυνατόν).

ΤΜΗΜΑ 5: Μέτρα για την καταπολέμηση της πυρκαγιάς

5.1. Πυροσβεστικά μέσα

Κατάλληλο μέσο κατάσβεσης:

Foam, extinguishing powder, sprinkling water jet, carbon dioxide.

Μέσα κατάσβεσης που δεν πρέπει να χρησιμοποιηθούν για λόγους ασφαλείας:

Μην χρησιμοποιείτε απευθείας πίδακες νερού επάνω στο φλεγόμενο προϊόν. ; Πρέπει να αποφεύγεται η ταυτόχρονη χρήση αφρού και νερού στη ίδια επιφάνεια διότι το νερό καταστρέφει τον αφρό

5.2. Ειδικοί κίνδυνοι που προκύπτουν από την ουσία ή το μείγμα

Μην εισπνέετε αέρια έκρηξης και ανάφλεξης.

Οι φλόγες που παράγονται από το καιόμενο υλικό είναι βραχείες, έχουν σκούρο κυανό χρώμα τη νύχτα και είναι αόρατες στο φως της ημέρας, εκτός του καπνού και της θερμότητας. ; Το καιόμενο υλικό αποκτά βαθύ μαύρο κόκκινο χρώμα.

Επικίνδυνα προϊόντα καύσης:

Στα προϊόντα καύσης περιλαμβάνονται οξείδια του θείου (SO2 and SO3) και υδρόθειο H2S.

5.3. Συστάσεις για τους πυροσβέστες

Να φοράτε κατάλληλη προστατευτική ένδυση (κράνος, γυαλιά, γάντια

πυρίμαχα, μπότες) και να προστατεύετε τα αναπνευστικά όργανα (αυτοδύναμες αναπνευστικές συσκευές).

Χρησιμοποιήστε κατάλληλη συσκευή αναπνοής.

Ψύξτε τα δοχεία που εκτίθενται στη φωτιά με νερό.

Μετακινήστε τα μη κατεστραμμένα κοντέινερ από την άμεση επικίνδυνη περιοχή, αν μπορείτε, με ασφάλεια.

Συλλέξτε ξεχωριστά το μολυσμένο νερό κατάσβεσης. Αυτό δεν πρέπει να πετιέται στην αποχέτευση.

Fire residues and contaminated firefighting water must be disposed of in accordance within the local regulations.

ΤΜΗΜΑ 6: Μέτρα για την αντιμετώπιση τυχαίας έκλυσης

6.1. Προσωπικές προφυλάξεις, προστατευτικός εξοπλισμός και διαδικασίες έκτακτης ανάγκης

Για προσωπικό μη έκτακτης ανάγκης:

Κρατήστε το μη εμπλεκόμενο προσωπικό μακριά από την περιοχή της διαρροής. Θέστε σε ετοιμότητα το προσωπικό έκτακτων καταστάσεων. ; Αποφύγετε την άμεση επαφή με το υλικό που απελευθερώθηκε.

Για άτομα που προσφέρουν πρώτες βοήθειες:

Σταματήστε τη διαρροή εάν είναι ασφαλές να το πράξετε. ; Αποφύγετε την άμεση επαφή με το υλικό που απελευθερώθηκε. ; Στις περιπτώσεις που η παρουσία επικίνδυνων ποσοτήτων H2S γύρω από τη διαρροή προϊόντος είναι αποδεδειγμένη ή ύποπτη, επιπρόσθετες ή ειδικές ενέργειες μπορεί να δικαιολογούνται, συμπεριλαμβανομένης της περιορισμένης πρόσβασης, της χρήσης ειδικού προστατευτικού εξοπλισμού, των διαδικασιών και της εκπαίδευσης του προσωπικού.

Να φοράτε εξοπλισμό προστασίας

Μεταφέρετε άτομα σε ασφάλεια.

Δείτε τα προστατευτικά μέτρα όπως στα σημεία 7 και 8.

6.2. Περιβαλλοντικές προφυλάξεις

Σταματήστε ή περιορίστε τη διαρροή στην πηγή της, εάν είναι ασφαλές να το πράξετε.

Μην επιτρέψετε να μπει στο έδαφος/υπέδαφος. Μην επιτρέψετε να μπει στην επιφάνεια του νερού ή στις αποχετεύσεις.

Κατακρατήστε το μολυσμένο νερό πλύσης και πετάξτε το.

Σε περίπτωση διαφυγής αέρα ή εισόδου μέσα στους σωλήνες νερού, στο έδαφος ή στις αποχετεύσεις, να πληροφορήσετε τις αρμόδιες αρχές.

6.3. Μέθοδοι και υλικά για περιορισμό και καθαρισμό

Πλύντε με άφθονο νερό.

Συλλέξτε το ελεύθερο προϊόν με τα κατάλληλα μηχανικά μέσα.

Dispose of the collected material in accordance with the current regulations.

6.4. Παραπομπή σε άλλα τμήματα

Δείτε επίσης το κεφάλαιο 8 και 13

ΤΜΗΜΑ 7: Χειρισμός και αποθήκευση

7.1. Προφυλάξεις για ασφαλή χειρισμό

Αποφύγετε την επαφή με το δέρμα και τα μάτια; Μη αναπνέετε την σκόνη. Βλέπετε και την επόμενη παράγραφο 8.; Κίνδυνος εκρηκτικών μειγμάτων από σκόνες και αέρα.

Μην χρησιμοποιήσετε άδειο κοντέινερ πριν αυτό καθαριστεί.

Πριν κάνετε λειτουργίες μεταφοράς, σιγουρευτείτε ότι δεν υπάρχει υπολείμματα ασύμβατων υλικών μέσα στα κοντέινερ.

Συστάσεις για τη γενική επαγγελματική υγιεινή:

Μολυσμένα ρούχα θα πρέπει να αλλάζονται πριν μπείτε σε περιοχές τροφίμων.

Κατά τη διάρκεια της εργασίας μην τρώτε ούτε πίνετε.

Δείτε επίσης το κεφάλαιο 8 για προτεινόμενο εξοπλισμό προστασίας.

7.2. Συνθήκες ασφαλούς φύλαξης, συμπεριλαμβανομένων τυχόν ασυμβίβαστων καταστάσεων

Κρατηθείτε μακριά από φαγητό, ποτό και τροφοδοσία.

Διατηρήστε τα δοχεία ερμητικά κλειστά, με την κατάλληλη επισήμανση.

Ασύμβατες ύλες:

Διατηρείτε μακριά από οζεισώτικά

Υπόδειξη για τους χώρους:

Διατηρείτε μακριά από εστίες φωτιάς, σπίθες και πηγές θερμότητας. Αποφύγετε την κατευθείαν έκθεση στον ήλιο.; Λάβετε προληπτικά μέτρα κατά της στατικής εκφόρτισης.

Χώροι κατάλληλα αεριζόμενοι.

7.3. Ειδική τελική χρήση ή χρήσεις

Συστάσεις

Κανένας ιδιαίτερα

Ειδικά διαλύματα για το βιομηχανικό τομέα

Κανένας ιδιαίτερα

ΤΜΗΜΑ 8: Έλεγχος της έκθεσης/ατομική προστασία

8.1. Παράμετροι ελέγχου

Τύπος Ορίου Επαγγελματικής Έκθεσης (OEE)	χώρα	Ανώτατο όριο	Μακροπρόθεσμα mg/m3	Μακροπρόθεσμα ppm	Βραχυπρόθεσμα mg/m3	Βραχυπρόθεσμα ppm	Συμπεριφορά	Σημειώσει
National	LATVIA		6.000					
National	ROMANIA				15.000			Dust - 15 minutes average value
ACGIH	NNN		3.000					respirable fraction
ACGIH	NNN		10.000					inhalable fraction

Δεν Προέκυψε Επίπεδο Αποτελέσματος. (DNEL)

Βιομηχανικός εργαζόμενος	Μη μισθωτός επαγγελματίας	Καταναλωτής	Οδός εκθέσεως σε ακτινοβολία	Συχνότητα έκθεσης	Σημειώσεις
4.000 mg/m3			Δια μέσου ανθρώπινης εισπνοής	Μακροπρόθεσμο, συστηματικές συνέπειες	
		0.500 mg/kg	Ανθρώπινη στοματική	Μακροπρόθεσμο, συστηματικές συνέπειες	
		0.500 mg/kg	Ανθρώπινη διά μέσου δέρματος	Μακροπρόθεσμο, συστηματικές συνέπειες	

8.2. Έλεγχοι έκθεσης

Μέτρα ατομικής προστασίας:

Η επιλογή του εξοπλισμού ατομικής προστασίας ποικίλει ανάλογα με τις συνθήκες πιθανής έκθεσης και τον κίνδυνο των συνθηκών εργασίας.

Η τελική επιλογή του εξοπλισμού ατομικής προστασίας εξαρτάται από την αξιολόγηση κινδύνου.

Ο προσωπικός προστατευτικός εξοπλισμός (ΠΠΕ) πρέπει να ανταποκρίνεται στα συνιστώμενα εθνικά πρότυπα. Απευθυνθείτε στους προμηθευτές ΠΠΕ για να βεβαιωθείτε σχετικά.

Για πληροφορίες σχετικά με τον εξοπλισμό επείγουσας προστασίας (πυρκαγιά ή τυχαία απελευθέρωση), βλ. Ενότητες 5 και 6.

Προστασία των ματιών:

Προστατευτικά γυαλιά χημικού κινδύνου (με πλευρική προστασία).; Πρότυπο τεχνικής αναφοράς: UNI EN 166

Προστασία του δέρματος:

Προστατευτική ενδυμασία κατάλληλη για χημικές ουσίες.; Πρότυπο τεχνικής αναφοράς: UNI EN 13034

Προστασία των χεριών:

Η επιλογή των κατάλληλων γαντιών εξαρτάται όχι μόνο από το υλικό αλλά και από άλλα ποιοτικά χαρακτηριστικά που διαφέρουν από τον έναν κατασκευαστή στον άλλο.

Οι συνθήκες εργασίας μπορούν να επηρεάσουν σημαντικά την καταλληλότητα και ανθεκτικότητα των γαντιών. Επικοινωνήστε με τον κατασκευαστή των γαντιών για συγκεκριμένες πληροφορίες σχετικά με την καταλληλότητα και αντοχή των γαντιών σε συγκεκριμένες συνθήκες εργασίας.

Χρησιμοποιείτε τα κατάλληλα γάντια ελεγμένα σύμφωνα με τον τύπο EN374.

Αναπνευστική προστασία:

Ανάλογα με το δυναμικό έκθεσης, επιλέξτε τις συσκευές προστασίας του αναπνευστικού που είναι κατάλληλες για τις συγκεκριμένες συνθήκες χρήσης και συμμορφώνονται με την ισχύουσα νομοθεσία.

Θερμικοί Κίνδυνοι:

N.A.

Έλεγχοι περιβαλλοντικής έκθεσης:

Comply with the applicable environmental regulations limiting discharge to air, water and soil.

Μέτρα υγιεινής και τεχνικά

N.A.

ΤΜΗΜΑ 9: Φυσικές και χημικές ιδιότητες

9.1. Στοιχεία για τις βασικές φυσικές και χημικές ιδιότητες

Φυσική κατάσταση: Στερεό
Όψη και χρώμα: Στερεό
Οσμή: σάπια αυγά
Κατώφλι Οσμής: N.A.
pH: N.A.
Σημείο τήξης / σημείο ψύξης: 113 - 120 °C (101,3 kPa; OECD 102)
Αρχικό σημείο βρασμού και εύρος βρασμού: 444,6 °C (101,3 kPa)
Σημείο ανάφλεξης: 190-220 °C
Ρυθμός Εξάτμισης: N.A.
Ανώτερη/κατώτερη αναφλεξιμότητα ή όρια έκρηξης: N.A.
Πυκνότητα των ατμών: N.A.
Πίεση ατμού: 0,14 mPa (20 °C, OECD 104)
Σχετική πυκνότητα: ±2 Kg/dm3
Υδροδιαλυτότητα: Insoluble
Διαλυτότητα σε λάδι: N.A.
Συντελεστής διαχωρισμού (n-οκτανολ/νερό): Ασήμαντο
Θερμοκρασία αυτό-ανάφλεξης: N.A.
Θερμοκρασία αποσύνθεσης: N.A.
Ιξώδες: N.A.
Εκρηκτικές ιδιότητες: N.A.
Καύσιμες υποβοηθούμενες ιδιότητες: N.A.
Ανάφλεξη στερεά/αέρια: N.A.
Πτητικά Οργανικά Μείγματα - VOC = N.A.

9.2. Άλλες πληροφορίες

Χαρακτηριστικές ιδιότητες των ομάδων των ουσιών N.A.
Αναμιξιμότητα: N.A.
Επαγωγικότητα: N.A.

ΤΜΗΜΑ 10: Σταθερότητα και αντιδραστικότητα

10.1. Αντιδραστικότητα

Σταθερό σε κανονικές συνθήκες.

10.2. Χημική σταθερότητα

Σταθερό σε κανονικές συνθήκες.

10.3. Πιθανότητα επικίνδυνων αντιδράσεων

Σταθερό σε κανονικές συνθήκες.

10.4. Συνθήκες προς αποφυγήν

Αποφύγετε τη δημιουργία σκόνης.; Κρατήστε μακριά από θερμότητα/σπινθήρες/ακάλυπτες φλόγες/θερμές επιφάνειες.

10.5. Μη συμβατά υλικά

οξέα, αλκάλια, ΑλογονουΧΑ, οξειδωτικά

10.6. Επικίνδυνα προϊόντα αποσύνθεσης

Τοξικά αέρια

ΤΜΗΜΑ 11: Τοξικολογικές πληροφορίες

11.1. Πληροφορίες για τις τοξικολογικές επιπτώσεις

Τοξικολογικές πληροφορίες για την ουσία

α) οξεία τοξικότητα	Μη κατηγοριοποιημένο
	βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται.
	LC50 Εισπνοή Αρουραίος >= 5.43000 mg/l 4h - βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται. - OECD 403
	LD50 Στοματικώς Αρουραίος >= 2000.00000 mg/kg - βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται. - OECD 401
	LD50 Δέρμα Αρουραίος >= 2000.00000 mg/kg - βάσει των διαθέσιμων δεδομένων, τα

	κριτήρια ταξινόμησης δεν πληρούνται. - EPA OPP 81-2
β) διάβρωση και ερεθισμός του δέρματος	Το προϊόν ταξινομείται: Skin Irrit. 2(H315)
	Ερεθιστικό Δέρματος Θετικό - OECD 404
γ) σοβαρή βλάβη/ερεθισμός των ματιών	Μη κατηγοριοποιημένο
	βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται.
	- βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται. - OECD 405
δ) αναπνευστική ευαισθητοποίηση ή ευαισθητοποίηση του δέρματος	Μη κατηγοριοποιημένο
	βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται.
	Ευαισθητοποίηση Δέρματος Αρνητικό - βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται. - OECD 406
ε) μεταλλαξιγένεση γεννητικών κυττάρων	Μη κατηγοριοποιημένο
	βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται.
	Μεταλλαξογένεση Αρνητικό - βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται. - OECD 471 - Ames test
στ) καρκινογένεση	Μη κατηγοριοποιημένο
	βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται.
ζ) τοξικότητα για την αναπαραγωγή	Μη κατηγοριοποιημένο
	βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται.
η) STOT-εφάπαξ έκθεση	Μη κατηγοριοποιημένο
	βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται.
θ) STOT-επανειλημμένη έκθεση	Μη κατηγοριοποιημένο
	βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται.
	Μη Παρατηρημένο Ανάποδο Επίπεδο Στοματικώς Αρουραίος 1000.00000 mg/kg 90 days - βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται. - OECD 408
ι) τοξικότητα αναρρόφησης	Μη κατηγοριοποιημένο
	βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται.

ΤΜΗΜΑ 12: Οικολογικές πληροφορίες

12.1. Τοξικότητα

Χρησιμοποιείτε σύμφωνα με τις ορθές εργασιακές πρακτικές, αποφεύγοντας να διασκορπίσετε το προϊόν στο περιβάλλον.
Οικο-Τοξικολογική Ενημέρωση:

Στη λίστα των Eco-τοξικολογικών ιδιοτήτων του προϊόντος

Δεν ταξινομούνται για περιβαλλοντικούς κινδύνους

βάσει των διαθέσιμων δεδομένων, τα κριτήρια ταξινόμησης δεν πληρούνται.

a) Οξεία τοξικότητα του ύδατος : EC50 Ιχθύς Oncorhynchus mykiss 5.000 µg/L 96h OECD 203

a) Οξεία τοξικότητα του ύδατος : NOEC Άλγη > 0.005 mg/L 72h OECD 201

a) Οξεία τοξικότητα του ύδατος : EC50 Δάφνια > 5.000 µg/L 48h OECD 202

b) Χρονία τοξικότητα του ύδατος : NOEC Δάφνια > 100.000 mg/L 504h OECD 211

12.2. Ανθεκτικότητα και ικανότητα αποδόμησης

N.A.

12.3. Δυνατότητα βιοσυσσώρευσης

Βιοσυσσώρευση

Μη βιοσυσσωρευτικός

12.4. Κινητικότητα στο έδαφος

Κινητικότητα στο έδαφος
Μη κινητός

12.5. Αποτελέσματα της αξιολόγησης ΑΒΤ και αΑαΒ

Δεν υπάρχουν εξαρτήματα ΑΒΤ/vPvB.

12.6. Άλλες αρνητικές επιπτώσεις
Ν.Α.

ΤΜΗΜΑ 13: Στοιχεία σχετικά με τη διάθεση

13.1. Μέθοδοι διαχείρισης αποβλήτων
Εάν είναι δυνατόν ανακτάτε. Ενεργείτε σύμφωνα με τις ισχύουσες τοπικές και εθνικές διατάξεις.

ΤΜΗΜΑ 14: Πληροφορίες σχετικά με τη μεταφορά

14.1. Αριθμός ΟΗΕ
1350

14.2. Οικεία ονομασία αποστολής ΟΗΕ
ADR-Όνομα Αποστολής: ΘΕΙΟ
IATA-Τεχνικό όνομα: SULPHUR
IMDG-Τεχνικό όνομα: SULPHUR

14.3. Τάξη/-εις κινδύνου κατά τη μεταφορά
ADR-Οδική: 4.1
IATA-Κατηγορία: 4.1
IMDG-Κατηγορία: 4.1

14.4. Ομάδα συσκευασίας
ADR-Ομάδα Συσκευασίας: III
IATA-Ομάδα συσκευασίας: III
IMDG-Ομάδα συσκευασίας: III

14.5. Περιβαλλοντικοί κίνδυνοι
Θαλάσσιος ρύπος: Όχι
Περιβαλλοντικό Μολυσματικό: Όχι

14.6. Ειδικές προφυλάξεις για τον χρήστη
Οδικές και σιδηροδρομικές (ADR-RID):
ADR-Ετικέτα: 4.1
ADR - Αριθμός αναγνώρησης κινδύνου: 40
ADR-Ειδικές Προϋποθέσεις: 242
ADR-Κωδικός περιορισμού σε σήραγγα: 3 (E)
Αεροπορικές (IATA):
IATA-Αεροσκάφος Επιβατών: 446
IATA-Αεροσκάφος Εμπορεύματος: 449
IATA-Ετικέτα: 4.1
IATA-Δευτερεύοντες κίνδυνοι: -
IATA-Erg: 3L
IATA-Ειδικές Προϋποθέσεις: A105 A803
Θαλάσσιες (IMDG):
IMDG-Κανόνας Στοιβασίας: Category A SW1
IMDG-Σημείωση Στοιβασίας: SG17
IMDG-Δευτερεύοντες κίνδυνοι: -
IMDG-Ειδικές Προϋποθέσεις: 242 967
IMDG-Σελίδα: N/A
IMDG-Ετικέτα: N/A
IMDG-EMS: F-A, S-G
IMDG-MFAG: N/A

14.7. Χύδην μεταφορά σύμφωνα με το παράρτημα II της σύμβασης MARPOL και του κώδικα IBC
N.A.

ΤΜΗΜΑ 15: Στοιχεία νομοθετικού χαρακτήρα

15.1. Κανονισμοί/νομοθεσία σχετικά με την ασφάλεια, την υγεία και το περιβάλλον για την ουσία ή το μείγμα

Οδηγία 98/24/ΕΚ (Κίνδυνοι που σχετίζονται με χημικούς παράγοντες εργασίας)

Κανονισμός (ΕΚ) αριθ. 1907/2006 (REACH)

Κανονισμός (ΕΚ) αριθ. 1272/2008 (CLP)

Κανονισμός (ΕΚ) αριθ. 790/2009 (ATP 1 CLP) και (ΕΕ) αριθ. 758/2013

Κανονισμός (ΕΕ) αριθ. 286/2011 (ATP 2 CLP)

Κανονισμός (ΕΕ) αριθ. 618/2012 (ATP 3 CLP)

Κανονισμός (ΕΕ) αριθ. 487/2013 (ATP 4 CLP)

Κανονισμός (ΕΕ) αριθ. 944/2013 (ATP 5 CLP)

Κανονισμός (ΕΕ) αριθ. 605/2014 (ATP 6 CLP)

Κανονισμός (ΕΕ) αριθ. 2015/1221 (ATP 7 CLP)

Κανονισμός (ΕΕ) αριθ. 2016/918 (ATP 8 CLP)

Κανονισμός (ΕΕ) αριθ. 2016/1179 (ATP 9 CLP)

Κανονισμός (ΕΕ) αριθ. 2017/776 (ATP 10 CLP)

Κανονισμός (ΕΕ) αριθ. 2018/669 (ATP 11 CLP)

Κανονισμός (ΕΕ) αριθ. 2018/1480 (ATP 13 CLP)

Κανονισμός (ΕΕ) αριθ. 2019/521 (ATP 12 CLP)

Κανονισμός (ΕΕ) 2015/830

Περιορισμοί που σχετίζονται με το προϊόν ή τις περιεχόμενες ουσίες σύμφωνα με το Παράρτημα XVII του Κανονισμού (ΕΚ) 1907/2006 (REACH) και μεταγενέστερες τροποποιήσεις:

Περιορισμοί που αφορούν το προϊόν: Καμία

Περιορισμοί που αφορούν τις περιεχόμενες ουσίες: Καμία

Παροχές που σχετίζονται με την οδηγία ΕΕ 2012/18 (Seveso III):

Ν.Α.

Κανονισμού (ΕΕ) αριθ. 649/2012 (ο κανονισμός ΣΜΕ)

Δεν υπάρχουν καταλογογραφημένες ουσίες

Όπου είναι εφαρμοστέα, αναφερόσαστε στα ακόλουθα πρότυπα:

Γερμανική Ταξινόμηση Επικινδυνότητας Νερού.

Κλάση 1: ελαφρώς επικίνδυνο για το νερό.

ΟΥΣΙΕΣ SVHC:

Κανένα Δεδομένο Διαθέσιμο

15.2. Αξιολόγηση χημικής ασφάλειας

Αξιολόγηση χημικής ασφάλειας έχει γίνει για την ουσία

Ουσίες για τις οποίες μια Αξιολόγηση χημικής ασφάλειας έχει διεξαχθεί:

θείο

ΤΜΗΜΑ 16: Άλλες πληροφορίες

Το έγγραφο αυτό καταρτίστηκε από αρμόδιο ατομο το οποίο εκπαιδεύτηκε κατάλληλα.

κυριότερες βιβλιογραφικές πηγές:

ECDIN - Δεδομένα περιβαλλοντικών χημικών ουσιών και δίκτυο πληροφόρησης - Κοινό Ερευνητικό Κέντρο, Επιτροπή Ευρωπαικών Κοινοτήτων

SAX's ΕΠΙΚΙΝΔΥΝΕΣ ΙΔΙΟΤΗΤΕΣ ΒΙΟΜΗΧΑΝΙΚΩΝ ΥΛΙΚΩΝ - Όγδοη έκδοση - Van Nostrand Reinold

Οι πληροφορίες που περιέχονται ενταύθα βασίζονται στις γνώσεις μας στην ανωτέρω αναγραφόμενη ημερομηνία. Αναφέρονται μόνο στο υποδεικνυόμενο προϊόν και δεν συνιστούν εγγύηση ιδιαιτέρων ποιοτήτων.

Ο χρήστης πρέπει να βεβαιωθεί για την καταλληλότητα και την πληρότητα αυτών των πληροφοριών σε σχέση με την ιδιαίτερη χρήση την οποία πρέπει να κάνει.

Αυτό το δελτίο ακυρώνει και αντικαθιστά κάθε προηγούμενη έκδοση.

Λεζάντα για συντομεύσεις και ακρόνυμα που χρησιμοποιούνται στο φύλλο των δεδομένων ασφαλείας:

ACGIH: Αμερικανικό Συνέδριο Κυβερνητικών Υγιεινολόγων της Βιομηχανίας

ADR: Ευρωπαϊκή Συμφωνία που αφορά τη Διεθνή Οδική Μεταφορά Επικινδύνων Εμπορευμάτων.

AND: Ευρωπαϊκή συμφωνία για τις διεθνείς μεταφορές επικίνδυνων εμπορευμάτων μέσω εσωτερικών πλωτών οδών

ATE: Εκτίμηση Οξείας Τοξικότητας

ATEmix: Εκτίμηση οξείας τοξικότητας (Μείγματα)

BCF: Παράγοντας Βιολογικής Συγκέντρωσης
BEI: Δείκτης Βιολογικής Έκθεσης
BOD: Ζήτηση Βιοχημικού Οξυγόνου
CAS: Υπηρεσία Χημικών Συνόψεων (τμήμα της Αμερικανικής Ένωσης Χημικών).
CAV: Κέντρο Δηλητηριάσεων
CE: Ευρωπαϊκή Κοινότητα
CLP: Ταξινόμηση, Ετικετοποίηση, Συσκευασία.
CMR: Καρκινογόνο, Μεταλλαξιογόνο και Τοξικό για αναπαραγωγή
COD: Ζήτηση Χημικού Οξυγόνου
COV: Πτητική Οργανική Ένωση
CSA: Αξιολόγηση Χημικής Ασφάλειας
CSR: Αναφορά Χημικής Ασφάλειας
DMEL: Επίπεδο Ελάχιστης Προκύπτουσας Συνέπειας
DNEL: Δεν Προέκυψε Επίπεδο Αποτελέσματος.
DPD: Οδηγία Επικίνδυνων Ετοιμασιών
DSD: Οδηγία Επικίνδυνων Ουσιών
EC50: Ήμισυ Μέγιστη Αποτελεσματική Συγκέντρωση
ECHA: Ευρωπαϊκό Πρακτορείο Χημικών
EINECS: Ευρωπαϊκή Απογραφή των Υπάρχοντων Εμπορεύσιμων Χημικών Ουσιών.
ES: Σενάριο έκθεσης
GefStoffVO: Διάταγμα περί Επικίνδυνων Ουσιών, Γερμανία.
GHS: Παγκοσμίως Εναρμονισμένο Σύστημα Ταξινόμησης και Ετικετοποίησης των Χημικών.
IARC: Διεθνές Πρακτορείο Έρευνας κατά του Καρκίνου
IATA: Διεθνής Ένωση Αερομεταφορών.
IATA-DGR: Κανονισμός Επικίνδυνων Εμπορευμάτων από την "Διεθνή Ένωση Αερομεταφορών" (IATA).
IC50: Ήμισυ μέγιστη ανασταλτική συγκέντρωση
ICAO: Διεθνής Οργανισμός Πολιτικής Αεροπορίας.
ICAO-TI: Τεχνικές Οδηγίες από το "Διεθνή Οργανισμό Πολιτικής Αεροπορίας" (ICAO).
IMDG: Διεθνής Ναυτιλιακός Κώδικας Επικίνδυνων Εμπορευμάτων.
INCI: Διεθνής Ονοματολογία Συστατικών Κοσμετολογίας.
IRCCS: Εθνικό Ίδρυμα Έρευνας, Νοσηλείας και Υγειονομικής Περίθαλψης
KAFH: KAFH
KSt: Συντελεστής έκρηξης.
LC50: Θανατηφόρος συγκέντρωση, για 50 τοις εκατό του πληθυσμού δοκιμής.
LD50: Θανατηφόρος δόση,50 τοις εκατό του πληθυσμού δοκιμής.
LDLo: Χαμηλή Θανατηφόρα Δόση
N.A.: Δεν Εφαρμόζεται
N/A: Δεν Εφαρμόζεται
N/D: Δεν καθορίστηκε/Δεν διατίθεται
NA: Μη διαθέσιμο
NIOSH: Εθνικό Ινστιτούτο Επαγγελματικής Ασφάλειας και Υγείας
NOAEL: Δεν Παρατηρήθηκε Επίπεδο Δυσμενών Επιπτώσεων
OSHA: Διοίκηση Επαγγελματικής Ασφάλειας και Υγείας
PBT: Ανθεκτικό, Βιοσυσσωρεύσιμο και Τοξικό
PGK: Οδηγίες συσκευασίας
PNEC: Δεν Προβλέφθηκε Συγκέντρωση Αποτελέσματος.
PSG: Επιβάτες
RID: Κανονισμός Σχετικά με τη Διεθνή Μεταφορά Επικίνδυνων Εμπορευμάτων με Σιδηρόδρομο.
STEL: Βραχυπρόθεσμο όριο Έκθεσης.
STOT: Τοξικότητα Οργάνου Ειδικού Στόχου.
TLV: Περιορισμένη Τιμή Κατωφλιού.
TWATLV: Οριακή Τιμή Κατωφλιού για τη Χρονικά Σταθμισμένη Μέση Τιμή της 8ωρης ημέρας. (Πρότυπο ACGIH).
vPvB: Πολύ Ανθεκτικό, Πολύ Βιοσυσσωρεύσιμο.
WGK: Γερμανική Ταξινόμηση Επικινδυνότητας Νερού.

Παράγραφοι τροποιημένες από την προηγούμενη αναθεώρηση:

- Δελτίου δεδομένων ασφαλείας
- 1. ΣΤΟΙΧΕΙΑ ΤΗΣ ΟΥΣΙΑΣ/ΠΑΡΑΣΚΕΥΑΣΜΑΤΟΣ ΚΑΙ ΕΤΑΙΡΕΙΑΣ/ΕΠΙΧΕΙΡΗΣΗΣ
- 2. ΠΕΡΙΓΡΑΦΗ των κινδύνων
- 3. ΣΥΝΘΕΣΗ/ΠΛΗΡΟΦΟΡΙΑ ΓΙΑ ΤΑ ΣΥΣΤΑΤΙΚΑ
- 4. ΠΡ ΩΤΕΣ ΒΟΗΘΕΙΕΣ
- 5. ΜΕΤΡΑ ΓΙΑ ΤΗΝ ΚΑΤΑΠΟΛΕΜΗΣΗ ΤΗΣ ΠΥΡΚΑΓΙΑΣ
- 6. ΜΕΤΡΑ ΓΙΑ ΤΗΝ ΑΝΤΙΜΕΤ ΩΠΙΣΗ ΤΥΧΑΙΑΣ ΕΚΛΥΣΗΣ

- 7. ΧΕΙΡΙΣΜΟΣ ΚΑΙ ΑΠΟΘΗΚΕΥΣΗ
- 8. ΕΛΕΓΧΟΣ ΤΗΣ ΕΚΘΕΣΗΣ ΣΤΟ ΠΡΟΪΟΝΤΑ/ΑΤΟΜΙΚΗ ΠΡΟΣΤΑΣΙΑ
- 9. ΦΥΣΙΚΕΣ ΚΑΙ ΧΗΜΙΚΕΣ ΙΔΙΟΤΗΤΕΣ
- 10. ΣΤΑΘΕΡΟΤΗΤΑ ΚΑΙ ΑΝΤΙΔΡΑΣΙΜΟΤΗΤΑ
- 11. ΤΟΞΙΚΟΛΟΓΙΚΑ ΣΤΟΙΧΕΙΑ
- 12. ΟΙΚΟΛΟΓΙΚΑ ΣΤΟΙΧΕΙΑ
- 13. ΣΤΟΙΧΕΙΑ ΣΧΕΤΙΚΑ ΜΕ ΤΗ ΔΙΑΘΕΣΗ (ΕΞΑΛΕΙΨΗ)
- 14. ΣΤΟΙΧΕΙΑ ΣΧΕΤΙΚΑ ΜΕ ΤΗ ΜΕΤΑΦΟΡΑ
- 15. ΣΤΟΙΧΕΙΑ ΣΧΕΤΙΚΑ ΜΕ ΤΙΣ ΚΑΝΟΝΙΣΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ
- 16. ΑΛΛΑ ΣΤΟΙΧΕΙΑ

EXPOSUR SCENARIO

SULPHUR

EC-No.: 231-722-6 CAS-No.: 7704-34-9 REACH registration No: 01-2119487295-27

SUMMARY

EXPOSUR SCENARIO

SULPHUR

EC-No.: 231-722-6 CAS-No.: 7704-34-9 REACH registration No: 01-2119487295-27

1. 01: Manufacture of substance

1.1. Title section

1. Manufacture of substance - industrial

Association ref code: CONC.1.LU.1

Environment		
GEN-01	General measures (skin irritants)	ERC1, ESVOC SPERC 1.1.v1
Worker		
CS15	General exposures (closed systems)	PROC1
CS15	General exposures (closed systems) - Process sampling - Outdoor	PROC2
CS15	General exposures (closed systems) + Batch process	PROC3
CS2	Process sampling	PROC3
CS16	General exposures (open systems)	PROC4
CS36	Laboratory activities	PROC15
CS14	Bulk transfers	PROC8b
CS39	Equipment cleaning and maintenance	PROC8a
CS85	Bulk product storage	PROC1, PROC2

Processes, tasks, activities covered	Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container). Industrial use
Assessment method	See Section 3.

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: General measures (skin irritants) (ERC1, ESVOC SPERC 1.1.v1)

ERC1	Manufacture of the substance
ESVOC SPERC 1.1.v1	Manufacture of substances: Industrial (SU8, SU9)

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	vapour pressure < 0.5 kPa at STP

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	3693365,731 t/yr
Covers daily exposures up to 8 hours (unless stated differently)	

Conditions and measures related to personal protection, hygiene and health evaluation

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	General measures (skin irritants)

1.2.2. Control of worker exposure: General exposures (closed systems) (PROC1)

PROC1	Use in closed process, no likelihood of exposure (no sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Handle substance within a closed system	
No other specific measures identified	

Other conditions affecting workers exposure

Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

1.2.3. Control of worker exposure: General exposures (closed systems) - Process sampling - Outdoor (PROC2)

PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Handle substance within a closed system	
Sample via a closed loop or other system to avoid exposure	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

1.2.4. Control of worker exposure: General exposures (closed systems) + Batch process (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Provide extract ventilation to points where emissions occur	
Without LEV	
Handle substance within a closed system	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Assumes activities are at ambient temperature (unless stated differently)	
Indoor	
Outdoor	
Provide closed or ventilated sample points.	

1.2.5. Control of worker exposure: Process sampling (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Ensure material transfers are under containment or extract ventilation	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Assumes activities are at ambient temperature (unless stated differently)	
Outdoor	

1.2.6. Control of worker exposure: General exposures (open systems) (PROC4)

PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises

Amount used (or contained in articles), frequency and duration of use/exposure

Covers use up to (times/day of use):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

With LEV	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Assumes activities are at ambient temperature (unless stated differently)	
Indoor	

Outdoor	
Transfer via enclosed lines	

1.2.7. Control of worker exposure: Laboratory activities (PROC15)

PROC15	Use as laboratory reagent

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.	
Wear chemically resistant gloves (tested to EN374).	
Have the system examined and tested against its performance standard - generally at least every 14 months	

Other conditions affecting workers exposure

Indoor	
Assumes use at not more than 20°C above ambient temperature, unless stated differently	

1.2.8. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Ensure material transfers are under containment or extract ventilation	
Ensure operation is undertaken outdoors	
Clear transfer lines prior to de-coupling	
Avoid splashing	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Outdoor	
Assumes use at not more than 20°C above ambient temperature, unless stated differently	

1.2.9. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Deal with spills immediately	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure

Assumes activities are at ambient temperature (unless stated differently)	
Indoor	
Outdoor	
Transfer via enclosed lines	

1.2.10. Control of worker exposure: Bulk product storage (PROC1, PROC2)

PROC1	Use in closed process, no likelihood of exposure (no sampling)
PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Store substance within a closed system	
Ensure dedicated sample points are provided	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Avoid dip sampling.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure General measures (skin irritants) (ERC1, ESVOC SPERC 1.1.v1)

Information for contributing exposure scenario
No additional information.

1.3.2. Worker exposure General exposures (closed systems) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,01 mg/m³	0,003	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,003	

1.3.3. Worker exposure General exposures (closed systems) - Process sampling - Outdoor (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,125	

1.3.4. Worker exposure General exposures (closed systems) + Batch process (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

1.3.5. Worker exposure Process sampling (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

1.3.6. Worker exposure General exposures (open systems) (PROC4)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

1.3.7. Worker exposure Laboratory activities (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic	0 mg/kg bodyweight/day	0	Qualitative approach used to

effects			conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,125	

1.3.8. Worker exposure Bulk transfers (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

1.3.9. Worker exposure Equipment cleaning and maintenance (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

1.3.10. Worker exposure Bulk product storage (PROC1, PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,125	

1.4. Guidance to Downstream User (DU) to evaluate whether he works inside the boundaries set by the ES

1.4.1. Environment

Guidance - Environment	No exposure assessment presented for the environment

1.4.2. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

2. 02: Distribution of substance

2.1. Title section

2. Distribution of substance - industrial

Association ref code: CONC.2.LU.1A

Environment		
GEN-04	General measures (skin irritants)	ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Worker		
CS15	General exposures (closed systems)	PROC1
CS15	General exposures (closed systems) - Process sampling - Outdoor	PROC2
CS15	General exposures (closed systems) + Batch process	PROC3
CS2	Process sampling	PROC3
CS16	General exposures (open systems)	PROC4
CS36	Laboratory activities	PROC15
CS14	Bulk transfers	PROC8b
CS7	Small package filling	PROC9
CS39	Equipment cleaning and maintenance	PROC8a
CS85	Bulk product storage	PROC1, PROC2

Processes, tasks, activities covered	Bulk loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, and associated laboratory activities. Excludes emissions during transport. Industrial use
Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: General measures (skin irritants) (ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1)

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5	Use at industrial site leading to inclusion into/onto article
ERC6a	Use of intermediate
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC6c	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC7	Use of functional fluid at industrial site
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	Liquid, vapour pressure 0.5 - 10 kPa at STP

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	4074527,906 t/yr
Covers daily exposures up to 8 hours (unless stated differently)	

Conditions and measures related to personal protection, hygiene and health evaluation

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	General measures (skin irritants)

2.2.2. Control of worker exposure: General exposures (closed systems) (PROC1)

PROC1	Use in closed process, no likelihood of exposure (no sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle substance within a closed system	
Use in closed process, no likelihood of exposure	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

2.2.3. Control of worker exposure: General exposures (closed systems) - Process sampling - Outdoor (PROC2)

PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

2.2.4. Control of worker exposure: General exposures (closed systems) + Batch process (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide closed or ventilated sample points.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

2.2.5. Control of worker exposure: Process sampling (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide closed or ventilated sample points.	
Ensure material transfers are under containment or extract ventilation	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

2.2.6. Control of worker exposure: General exposures (open systems) (PROC4)

PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	

Provide extract ventilation to material transfer points and other openings	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

2.2.7. Control of worker exposure: Laboratory activities (PROC15)

PROC15	Use as laboratory reagent

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

2.2.8. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Ensure operation is undertaken outdoors	
Without LEV	
Ensure material transfers are under containment or extract ventilation. Clear lines prior to de-coupling.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

2.2.9. Control of worker exposure: Small package filling (PROC9)

PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Assumes activities are at ambient temperature (unless stated differently)	

2.2.10. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	

Drain down system prior to equipment break-in or maintenance	
Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure

Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

2.2.11. Control of worker exposure: Bulk product storage (PROC1, PROC2)

PROC1	Use in closed process, no likelihood of exposure (no sampling)
PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Ensure dedicated sample points are provided	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	

Other conditions affecting workers exposure

Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure General measures (skin irritants) (ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1)

Information for contributing exposure scenario
No additional information.

2.3.2. Worker exposure General exposures (closed systems) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,01 mg/m³	0,003	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,003	

2.3.3. Worker exposure General exposures (closed systems) - Process sampling - Outdoor (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,125	

2.3.4. Worker exposure General exposures (closed systems) + Batch process (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

2.3.5. Worker exposure Process sampling (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term -		0,25	

systemic effects			

2.3.6. Worker exposure General exposures (open systems) (PROC4)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

2.3.7. Worker exposure Laboratory activities (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,125	

2.3.8. Worker exposure Bulk transfers (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

2.3.9. Worker exposure Small package filling (PROC9)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

2.3.10. Worker exposure Equipment cleaning and maintenance (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

2.3.11. Worker exposure Bulk product storage (PROC1, PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,35 mg/m³	0,088	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,088	

2.4. Guidance to Downstream User (DU) to evaluate whether he works inside the boundaries set by the ES

2.4.1. Environment

Guidance - Environment	No exposure assessment presented for the environment

2.4.2. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. 03: Use as an intermediate

3.1. Title section

3. Use as an intermediate - Industrial

Association ref code: CONC.3.LU.1B

Environment		
GEN-03	General measures (skin irritants)	ERC6a, ESVOC SPERC 6.1a.v1
Worker		
CS15	General exposures (closed systems)	PROC1
CS15	General exposures (closed systems) - Process sampling - Outdoor	PROC2
CS15	General exposures (closed systems) + Batch process	PROC3
CS2	Process sampling	PROC3
CS16	General exposures (open systems)	PROC4
CS36	Laboratory activities	PROC15
CS14	Bulk transfers	PROC8b
CS39	Equipment cleaning and maintenance	PROC8a
CS15	General exposures (closed systems)	PROC22
CS16	General exposures (open systems)	PROC23
CS85	Bulk product storage	PROC1, PROC2

Processes, tasks, activities covered	Use of substance as an intermediate within closed or contained systems (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container). Industrial use
Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated The ConsExpo model has been used to estimate consumer exposures unless otherwise indicated.

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: General measures (skin irritants) (ERC6a, ESVOC SPERC 6.1a.v1)

ERC6a	Use of intermediate
ESVOC SPERC 6.1a.v1	Manufacture of substance: Industrial (SU8, SU9)

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	Liquid, vapour pressure 0.5 - 10 kPa at STP

Amount used, frequency and duration of use (or from service life)

Regional use tonnage (tonnes/year):	2885705,07 t/yr
Covers daily exposures up to 8 hours (unless stated differently)	

Conditions and measures related to personal protection, hygiene and health evaluation

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	General measures (skin irritants)

3.2.2. Control of worker exposure: General exposures (closed systems) (PROC1)

PROC1	Use in closed process, no likelihood of exposure (no sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Handle substance within a closed system	
Use in closed process, no likelihood of exposure	

Other conditions affecting workers exposure	
Outdoor	
Assumes use at not more than 20°C above ambient temperature, unless stated differently	

3.2.3. Control of worker exposure: General exposures (closed systems) - Process sampling - Outdoor (PROC2)

PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

3.2.4. Control of worker exposure: General exposures (closed systems) + Batch process (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Ensure dedicated sample points are provided	
Provide closed or ventilated sample points.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

3.2.5. Control of worker exposure: Process sampling (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide closed or ventilated sample points.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

3.2.6. Control of worker exposure: General exposures (open systems) (PROC4)

PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor/Outdoor use.	

Assumes activities are at ambient temperature (unless stated differently)	

3.2.7. Control of worker exposure: Laboratory activities (PROC15)

PROC15	Use as laboratory reagent

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

3.2.8. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Ensure material transfers are under containment or extract ventilation. Clear lines prior to de-coupling.	
Ensure operation is undertaken outdoors	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

3.2.9. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure

Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

3.2.10. Control of worker exposure: General exposures (closed systems) (PROC22)

PROC22	Potentially closed processing operations with minerals/metals at elevated temperature - Industrial setting

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Handle substance within a closed system	

Other conditions affecting workers exposure

Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

3.2.11. Control of worker exposure: General exposures (open systems) (PROC23)

PROC23	Open processing and transfer operations with minerals/metals at elevated temperature

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	
Without LEV	
Ensure material transfers are under containment or extract ventilation	

Other conditions affecting workers exposure	
Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

3.2.12. Control of worker exposure: Bulk product storage (PROC1, PROC2)

PROC1	Use in closed process, no likelihood of exposure (no sampling)
PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Ensure dedicated sample points are provided. Store substance within a closed system	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure General measures (skin irritants) (ERC6a, ESVOC SPERC 6.1a.v1)

Information for contributing exposure scenario
No additional information.

3.3.2. Worker exposure General exposures (closed systems) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,01 mg/m³	0,003	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,003	

3.3.3. Worker exposure General exposures (closed systems) - Process sampling - Outdoor (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,125	

3.3.4. Worker exposure General exposures (closed systems) + Batch process (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

3.3.5. Worker exposure Process sampling (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.

Sum RCR - Long-term - systemic effects		0,25	

3.3.6. Worker exposure General exposures (open systems) (PROC4)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

3.3.7. Worker exposure Laboratory activities (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,125	

3.3.8. Worker exposure Bulk transfers (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

3.3.9. Worker exposure Equipment cleaning and maintenance (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

3.3.10. Worker exposure General exposures (closed systems) (PROC22)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	3 mg/m³	0,75	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,75	

3.3.11. Worker exposure General exposures (open systems) (PROC23)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	3 mg/m³	0,75	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,75	

3.3.12. Worker exposure Bulk product storage (PROC1, PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,35 mg/m³	0,088	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,088	

3.4. Guidance to Downstream User (DU) to evaluate whether he works inside the boundaries set by the ES

3.4.1. Environment

Guidance - Environment	No exposure assessment presented for the environment

3.4.2. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4. 04: Formulation & (re)packing of substances and mixtures

4.1. Title section

4. Formulation & (re)packing of substances and mixtures - industrial

Association ref code: CONC.4.LU.2

Environment		
GEN-04	General measures (skin irritants)	ERC2, ESVOC SPERC 2.2.v1
Worker		
CS15	General exposures (closed systems)	PROC1
CS15	General exposures (closed systems) - Process sampling - Outdoor	PROC2
CS15	General exposures (closed systems) + Batch process	PROC3
CS2	Process sampling	PROC3
CS16	General exposures (open systems)	PROC4
CS30	Mixing operations (open systems)	PROC5
CS512	Milling, grinding and similar activities.	PROC24
CS7	Small package filling	PROC9
CS53	Production or preparation or articles by tabletting, compression, extrusion or pelletisation	PROC14
CS36	Laboratory activities	PROC15
CS14	Bulk transfers	PROC8b
CS39	Equipment cleaning and maintenance	PROC8a
CS16	General exposures (open systems)	PROC23
CS85	Bulk product storage	PROC1, PROC2

Processes, tasks, activities covered	Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities Industrial use
Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: General measures (skin irritants) (ERC2, ESVOC SPERC 2.2.v1)

ERC2	Formulation of preparations
ESVOC SPERC 2.2.v1	Formulation & (re)packing of substances and mixtures: Industrial (SU10)

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	Liquid, vapour pressure 0.5 - 10 kPa at STP

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	1188822,836 t/yr
Covers daily exposures up to 8 hours (unless stated differently)	

Conditions and measures related to personal protection, hygiene and health evaluation

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	General measures (skin irritants)

4.2.2. Control of worker exposure: General exposures (closed systems) (PROC1)

PROC1	Use in closed process, no likelihood of exposure (no sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle substance within a closed system	
Use in closed process, no likelihood of exposure	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

4.2.3. Control of worker exposure: General exposures (closed systems) - Process sampling - Outdoor (PROC2)

PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

4.2.4. Control of worker exposure: General exposures (closed systems) + Batch process (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide closed or ventilated sample points.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

4.2.5. Control of worker exposure: Process sampling (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide closed or ventilated sample points.	
Ensure material transfers are under containment or extract ventilation	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

4.2.6. Control of worker exposure: General exposures (open systems) (PROC4)

PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide extract ventilation to material transfer points and other openings	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	

Other conditions affecting workers exposure	
Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

4.2.7. Control of worker exposure: Mixing operations (open systems) (PROC5)

PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

4.2.8. Control of worker exposure: Milling, grinding and similar activities. (PROC24)

PROC24	High (mechanical) energy work-up of substances bound in materials and/or articles

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
With LEV	
Efficiency of at least:	80 %
Provide extract ventilation to points where emissions occur	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor	
Assumes activities are at ambient temperature (unless stated differently)	
assume high fugacity	

4.2.9. Control of worker exposure: Small package filling (PROC9)

PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
With LEV	
Efficiency of at least:	90 %
Provide extract ventilation to points where emissions occur	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor	
Assumes activities are at ambient temperature (unless stated differently)	
assume high fugacity	

4.2.10. Control of worker exposure: Production or preparation or articles by tabletting, compression, extrusion or pelletisation (PROC14)

PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide extract ventilation to points where emissions occur	

Other conditions affecting workers exposure	
Indoor	
Assumes use at not more than 20°C above ambient temperature, unless stated differently	

4.2.11. Control of worker exposure: Laboratory activities (PROC15)

PROC15	Use as laboratory reagent

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

4.2.12. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Ensure operation is undertaken outdoors	
Ensure material transfers are under containment or extract ventilation. Clear lines prior to de-coupling.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

4.2.13. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Drain down system prior to equipment break-in or maintenance	
Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure	
Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

4.2.14. Control of worker exposure: General exposures (open systems) (PROC23)

PROC23	Open processing and transfer operations with minerals/metals at elevated temperature

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Ensure material transfers are under containment or extract ventilation	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity	

Other conditions affecting workers exposure	
Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

4.2.15. Control of worker exposure: Bulk product storage (PROC1, PROC2)

PROC1	Use in closed process, no likelihood of exposure (no sampling)
PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Ensure dedicated sample points are provided	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure General measures (skin irritants) (ERC2, ESVOC SPERC 2.2.v1)

Information for contributing exposure scenario
No additional information.

4.3.2. Worker exposure General exposures (closed systems) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,01 mg/m³	0,003	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,003	

4.3.3. Worker exposure General exposures (closed systems) - Process sampling - Outdoor (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,125	

4.3.4. Worker exposure General exposures (closed systems) + Batch process (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

4.3.5. Worker exposure Process sampling (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

4.3.6. Worker exposure General exposures (open systems) (PROC4)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

4.3.7. Worker exposure Mixing operations (open systems) (PROC5)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

4.3.8. Worker exposure Milling, grinding and similar activities. (PROC24)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	2 mg/m³	0,5	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,5	

4.3.9. Worker exposure Small package filling (PROC9)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	2 mg/m³	0,5	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,5	

4.3.10. Worker exposure Production or preparation or articles by tabletting, compression, extrusion or pelletisation (PROC14)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

4.3.11. Worker exposure Laboratory activities (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,125	

4.3.12. Worker exposure Bulk transfers (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

4.3.13. Worker exposure Equipment cleaning and maintenance (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.

Sum RCR - Long-term - systemic effects		0,25	

4.3.14. Worker exposure General exposures (open systems) (PROC23)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	3 mg/m³	0,75	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,75	

4.3.15. Worker exposure Bulk product storage (PROC1, PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,35 mg/m³	0,088	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,088	

4.4. Guidance to Downstream User (DU) to evaluate whether he works inside the boundaries set by the ES

4.4.1. Environment

Guidance - Environment	No exposure assessment presented for the environment

4.4.2. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

5. 05: Use as binders and release agents

5.1. Title section

5. Use as binders and release agents - Industrial

Association ref code: CONC.16.LU.10

Environment		
GEN-05	General measures (skin irritants)	ERC4, ESVOC SPERC 4.10a.v1
Worker		
CS15	General exposures (closed systems)	PROC1
CS15	General exposures (closed systems) - Process sampling - Outdoor	PROC2
CS15	General exposures (closed systems) + Batch process	PROC3
CS16	General exposures (open systems)	PROC4
CS30	Mixing operations (open systems)	PROC6
CS98	Roller, spreader, flow application	PROC10
CS4	Dipping, immersion and pouring	PROC13
CS130	Article formation in mould	PROC14
CS14	Bulk transfers	PROC8b
CS39	Equipment cleaning and maintenance	PROC8a

Processes, tasks, activities covered	Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting, and handling of waste. Industrial use
Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: General measures (skin irritants) (ERC4, ESVOC SPERC 4.10a.v1)

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ESVOC SPERC 4.10a.v1	Use as binders and release agents: Industrial (SU3)

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	Liquid, vapour pressure 0.5 - 10 kPa at STP

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	216338,722 t/yr
Covers daily exposures up to 8 hours (unless stated differently)	

Conditions and measures related to personal protection, hygiene and health evaluation

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	General measures (skin irritants)
Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	General measures (skin irritants)

5.2.2. Control of worker exposure: General exposures (closed systems) (PROC1)

PROC1	Use in closed process, no likelihood of exposure (no sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Continuous process	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Handle substance within a closed system	
Use in closed process, no likelihood of exposure	

Other conditions affecting workers exposure	
Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

5.2.3. Control of worker exposure: General exposures (closed systems) - Process sampling - Outdoor (PROC2)

PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Continuous process	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

5.2.4. Control of worker exposure: General exposures (closed systems) + Batch process (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide closed or ventilated sample points.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

5.2.5. Control of worker exposure: General exposures (open systems) (PROC4)

PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide extract ventilation to material transfer points and other openings	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

5.2.6. Control of worker exposure: Mixing operations (open systems) (PROC6)

PROC6	Calendering operations

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure	
Indoor	
elevated temperature	

5.2.7. Control of worker exposure: Roller, spreader, flow application (PROC10)

PROC10	Roller application or brushing

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor	
elevated temperature	

5.2.8. Control of worker exposure: Dipping, immersion and pouring (PROC13)

PROC13	Treatment of articles by dipping and pouring

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
elevated temperature	

5.2.9. Control of worker exposure: Article formation in mould (PROC14)

PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor	
Assumes use at not more than 20°C above ambient temperature, unless stated differently	

5.2.10. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Ensure material transfers are under containment or extract ventilation. Clear lines prior to de-coupling.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	

Assumes activities are at ambient temperature (unless stated differently)	

5.2.11. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Drain down system prior to equipment break-in or maintenance	
Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure

Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure General measures (skin irritants) (ERC4, ESVOC SPERC 4.10a.v1)

Information for contributing exposure scenario
No additional information.

5.3.2. Worker exposure General exposures (closed systems) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,01 mg/m³	0,003	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,003	

5.3.3. Worker exposure General exposures (closed systems) - Process sampling - Outdoor (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,125	

5.3.4. Worker exposure General exposures (closed systems) + Batch process (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

5.3.5. Worker exposure General exposures (open systems) (PROC4)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

5.3.6. Worker exposure Mixing operations (open systems) (PROC6)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	
Sum RCR - Long-term - systemic effects		0,875	

5.3.7. Worker exposure Roller, spreader, flow application (PROC10)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1,5 mg/m³	0,375	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,375	

5.3.8. Worker exposure Dipping, immersion and pouring (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

5.3.9. Worker exposure Article formation in mould (PROC14)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

5.3.10. Worker exposure Bulk transfers (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

5.3.11. Worker exposure Equipment cleaning and maintenance (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

5.4. Guidance to Downstream User (DU) to evaluate whether he works inside the boundaries set by the ES

5.4.1. Environment

Guidance - Environment	No exposure assessment presented for the environment

5.4.2. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

6. 06: Rubber production and processing

6.1. Title section

6. Rubber production and processing - Industrial

Association ref code: CONC.21.LU.19

Environment		
GEN-06	General measures (skin irritants)	ERC4, ERC6d, ESVOC SPERC 4.19.v1
Worker		
CS15	General exposures (closed systems)	PROC1
CS15	General exposures (closed systems) - Process sampling - Outdoor	PROC2
CS15	General exposures (closed systems) + Batch process	PROC3
CS16	General exposures (open systems)	PROC4
CS30	Mixing operations (open systems)	PROC5
CS64	Calendering (including Banburys)	PROC6
CS10	Spraying	PROC7
CS90	Small scale weighing	PROC9
CS4	Dipping, immersion and pouring	PROC13
CS73	Pressing uncured rubber blanks	PROC14
CS102	Finishing operations	PROC21
CS36	Laboratory activities	PROC15
CS14	Bulk transfers	PROC8b
CS39	Equipment cleaning and maintenance	PROC8a

Processes, tasks, activities covered	Manufacture of tyres and general rubber articles within closed or contained systems, including incidental exposures during processing of raw (uncured) rubber, handling and mixing of rubber additives, calendaring, vulcanising, cooling and finishing as well as maintenance. Industrial use
Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: General measures (skin irritants) (ERC4, ERC6d, ESVOC SPERC 4.19.v1)

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ESVOC SPERC 4.19.v1	Rubber production and processing: Industrial (SU10)

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	Liquid, vapour pressure 0.5 - 10 kPa at STP

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	273627,095 t/yr
Covers daily exposures up to 8 hours (unless stated differently)	

Conditions and measures related to personal protection, hygiene and health evaluation

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	General measures (skin irritants)
Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	General measures (skin irritants)

6.2.2. Control of worker exposure: General exposures (closed systems) (PROC1)

PROC1	Use in closed process, no likelihood of exposure (no sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle substance within a closed system	
Use in closed process, no likelihood of exposure	

Other conditions affecting workers exposure	
Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

6.2.3. Control of worker exposure: General exposures (closed systems) - Process sampling - Outdoor (PROC2)

PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

6.2.4. Control of worker exposure: General exposures (closed systems) + Batch process (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide closed or ventilated sample points.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

6.2.5. Control of worker exposure: General exposures (open systems) (PROC4)

PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide extract ventilation to material transfer points and other openings	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

6.2.6. Control of worker exposure: Mixing operations (open systems) (PROC5)

PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

6.2.7. Control of worker exposure: Calendering (including Banburys) (PROC6)

PROC6	Calendering operations

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure	
Indoor	
elevated temperature	
Vulcanisation	
Cooling cured articles	

6.2.8. Control of worker exposure: Spraying (PROC7)

PROC7	Industrial spraying

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
With LEV	
Efficiency of at least:	95 %
Provide the operation with a properly sited receiving hood	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure	
Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	
Vulcanisation	
Cooling cured articles	

6.2.9. Control of worker exposure: Small scale weighing (PROC9)

PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

6.2.10. Control of worker exposure: Dipping, immersion and pouring (PROC13)

PROC13	Treatment of articles by dipping and pouring

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Outdoor	
elevated temperature	

6.2.11. Control of worker exposure: Pressing uncured rubber blanks (PROC14)

PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Indoor	
Assumes use at not more than 20°C above ambient temperature, unless stated differently	

6.2.12. Control of worker exposure: Finishing operations (PROC21)

PROC21	Low energy manipulation of substances bound in materials and/or articles

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Indoor/Outdoor use.	
Assumes use at not more than 20°C above ambient temperature, unless stated differently	

6.2.13. Control of worker exposure: Laboratory activities (PROC15)

PROC15	Use as laboratory reagent

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

6.2.14. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	

Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Ensure material transfers are under containment or extract ventilation. Clear lines prior to de-coupling.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

6.2.15. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Drain down system prior to equipment break-in or maintenance	
Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure

Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

6.3. Exposure estimation and reference to its source

6.3.1. Environmental release and exposure General measures (skin irritants) (ERC4, ERC6d, ESVOC SPERC 4.19.v1)

Information for contributing exposure scenario
No additional information.

6.3.2. Worker exposure General exposures (closed systems) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,01 mg/m³	0,003	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,003	

6.3.3. Worker exposure General exposures (closed systems) - Process sampling - Outdoor (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,125	

6.3.4. Worker exposure General exposures (closed systems) + Batch process (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

6.3.5. Worker exposure General exposures (open systems) (PROC4)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use

Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

6.3.6. Worker exposure Mixing operations (open systems) (PROC5)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

6.3.7. Worker exposure Calendering (including Banburys) (PROC6)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	
Sum RCR - Long-term - systemic effects		0,875	

6.3.8. Worker exposure Spraying (PROC7)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	
Sum RCR - Long-term - systemic effects		0,25	

6.3.9. Worker exposure Small scale weighing (PROC9)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

6.3.10. Worker exposure Dipping, immersion and pouring (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

6.3.11. Worker exposure Pressing uncured rubber blanks (PROC14)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

6.3.12. Worker exposure Finishing operations (PROC21)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3 mg/m³	0,75	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,75	

6.3.13. Worker exposure Laboratory activities (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR	Method

Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term -		0,125	
systemic effects			

6.3.14. Worker exposure Bulk transfers (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

6.3.15. Worker exposure Equipment cleaning and maintenance (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

6.4. Guidance to Downstream User (DU) to evaluate whether he works inside the boundaries set by the ES

6.4.1. Environment

Guidance - Environment	No exposure assessment presented for the environment

6.4.2. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

7. 07: Use as a fuel

7.1. Title section

7. Use as a fuel - Industrial

Association ref code: CONC.24.LU.12

Environment		
GEN-07	General measures (skin irritants)	ERC7, ESVOC SPERC 7.12a.v1
Worker		
CS15	General exposures (closed systems)	PROC1
CS15	General exposures (closed systems) - Process sampling - Outdoor	PROC2
CS15	General exposures (closed systems) + Batch process	PROC3
CS2	Process sampling	PROC3
CS16	General exposures (open systems)	PROC4
CS107	(closed systems)	PROC16
CS14	Bulk transfers	PROC8b
CS39	Equipment cleaning and maintenance	PROC8a
CS85	Bulk product storage	PROC1, PROC2

Processes, tasks, activities covered	Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste. Industrial use
Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

7.2. Conditions of use affecting exposure

7.2.1. Control of environmental exposure: General measures (skin irritants) (ERC7, ESVOC SPERC 7.12a.v1)

ERC7	Use of functional fluid at industrial site
ESVOC SPERC 7.12a.v1	Use as a fuel: Industrial (SU3)

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	vapour pressure < 0.5 kPa at STP

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	9634,326 t/yr
Covers daily exposures up to 8 hours (unless stated differently)	

Conditions and measures related to personal protection, hygiene and health evaluation

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	General measures (skin irritants)

7.2.2. Control of worker exposure: General exposures (closed systems) (PROC1)

PROC1	Use in closed process, no likelihood of exposure (no sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Handle substance within a closed system	
No other specific measures identified	

Other conditions affecting workers exposure

Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

7.2.3. Control of worker exposure: General exposures (closed systems) - Process sampling - Outdoor (PROC2)

PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Handle substance within a closed system	
Sample via a closed loop or other system to avoid exposure	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

7.2.4. Control of worker exposure: General exposures (closed systems) + Batch process (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Provide extract ventilation to points where emissions occur	
Handle substance within a closed system	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Assumes activities are at ambient temperature (unless stated differently)	
Outdoor	
Provide closed or ventilated sample points.	

7.2.5. Control of worker exposure: Process sampling (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Provide closed or ventilated sample points.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Assumes activities are at ambient temperature (unless stated differently)	
Outdoor	

7.2.6. Control of worker exposure: General exposures (open systems) (PROC4)

PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises

Amount used (or contained in articles), frequency and duration of use/exposure

Covers use up to (times/day of use):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

With LEV	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Assumes activities are at ambient temperature (unless stated differently)	
Indoor/Outdoor use.	
Transfer via enclosed lines	

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Handle substance within a closed system	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

7.2.8. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Ensure material transfers are under containment or extract ventilation	
Ensure operation is undertaken outdoors	
Clear transfer lines prior to de-coupling	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature or carried out at elevated temperature (> 20°C above ambient temperature)	

7.2.9. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure	
Assumes activities are at ambient temperature (unless stated differently)	
Indoor/Outdoor use.	
Transfer via enclosed lines	

7.2.10. Control of worker exposure: Bulk product storage (PROC1, PROC2)

PROC1	Use in closed process, no likelihood of exposure (no sampling)
PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Store substance within a closed system	
Ensure dedicated sample points are provided	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

7.3. Exposure estimation and reference to its source

7.3.1. Environmental release and exposure General measures (skin irritants) (ERC7, ESVOC SPERC 7.12a.v1)

Information for contributing exposure scenario
No additional information.

7.3.2. Worker exposure General exposures (closed systems) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,01 mg/m³	0,003	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,003	

7.3.3. Worker exposure General exposures (closed systems) - Process sampling - Outdoor (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,5 mg/m³	0,125	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,125	

7.3.4. Worker exposure General exposures (closed systems) + Batch process (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

7.3.5. Worker exposure Process sampling (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

7.3.6. Worker exposure General exposures (open systems) (PROC4)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

7.3.7. Worker exposure (closed systems) (PROC16)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

7.3.8. Worker exposure Bulk transfers (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

7.3.9. Worker exposure Equipment cleaning and maintenance (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

7.3.10. Worker exposure Bulk product storage (PROC1, PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,35 mg/m³	0,088	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,088	

7.4. Guidance to Downstream User (DU) to evaluate whether he works inside the boundaries set by the ES

7.4.1. Environment

Guidance - Environment	No exposure assessment presented for the environment

7.4.2. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

8. 08: Use as binders and release agents - Professional

8.1. Title section

8. Use as binders and release agents - Professional

Association ref code: CONC.17.LU.10

Environment		
GEN-08	General measures (skin irritants)	ERC8a, ERC8d, ESVOC SPERC 8.10b.v1
Worker		
CS15	General exposures (closed systems)	PROC1
CS15	General exposures (closed systems) - Process sampling - Outdoor	PROC2
CS15	General exposures (closed systems) + Batch process	PROC3
CS16	General exposures (open systems)	PROC4
CS30	Mixing operations (open systems)	PROC6
CS98	Roller, spreader, flow application	PROC10
CS4	Dipping, immersion and pouring	PROC13
CS130	Article formation in mould	PROC14
CS14	Bulk transfers	PROC8b
CS39	Equipment cleaning and maintenance	PROC8a

Processes, tasks, activities covered	Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste. Professional use
Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

8.2. Conditions of use affecting exposure

8.2.1. Control of environmental exposure: General measures (skin irritants) (ERC8a, ERC8d, ESVOC SPERC 8.10b.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ESVOC SPERC 8.10b.v1	Use as binders and release agents: Professional (SU22)

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	Liquid, vapour pressure 0.5 - 10 kPa at STP

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	18 t/yr
Covers daily exposures up to 8 hours (unless stated differently)	

Conditions and measures related to personal protection, hygiene and health evaluation

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	General measures (skin irritants)
Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	General measures (skin irritants)

8.2.2. Control of worker exposure: General exposures (closed systems) (PROC1)

PROC1	Use in closed process, no likelihood of exposure (no sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation

Handle substance within a closed system	
Use in closed process, no likelihood of exposure	

Other conditions affecting workers exposure	
Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

8.2.3. Control of worker exposure: General exposures (closed systems) - Process sampling - Outdoor (PROC2)

PROC2	Use in closed, continuous process with occasional controlled exposure (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

8.2.4. Control of worker exposure: General exposures (closed systems) + Batch process (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide closed or ventilated sample points.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

8.2.5. Control of worker exposure: General exposures (open systems) (PROC4)

PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide extract ventilation to material transfer points and other openings	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

8.2.6. Control of worker exposure: Mixing operations (open systems) (PROC6)

PROC6	Calendering operations

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure	
Indoor	
elevated temperature	

8.2.7. Control of worker exposure: Roller, spreader, flow application (PROC10)

PROC10	Roller application or brushing

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor	
elevated temperature	

8.2.8. Control of worker exposure: Dipping, immersion and pouring (PROC13)

PROC13	Treatment of articles by dipping and pouring

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
elevated temperature	

8.2.9. Control of worker exposure: Article formation in mould (PROC14)

PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

8.2.10. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Ensure material transfers are under containment or extract ventilation. Clear lines prior to de-coupling.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

8.2.11. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Drain down system prior to equipment break-in or maintenance	
Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure	
Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

8.3. Exposure estimation and reference to its source

8.3.1. Environmental release and exposure General measures (skin irritants) (ERC8a, ERC8d, ESVOC SPERC 8.10b.v1)

Information for contributing exposure scenario
No additional information.

8.3.2. Worker exposure General exposures (closed systems) (PROC1)

Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,01 mg/m³	0,003	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,003	

8.3.3. Worker exposure General exposures (closed systems) - Process sampling - Outdoor (PROC2)

Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

8.3.4. Worker exposure General exposures (closed systems) + Batch process (PROC3)

Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

8.3.5. Worker exposure General exposures (open systems) (PROC4)

Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

8.3.6. Worker exposure Mixing operations (open systems) (PROC6)

Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	

Sum RCR - Long-term - systemic effects		0,875	

8.3.7. Worker exposure Roller, spreader, flow application (PROC10)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1,5 mg/m³	0,375	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,375	

8.3.8. Worker exposure Dipping, immersion and pouring (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1,5 mg/m³	0,375	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,375	

8.3.9. Worker exposure Article formation in mould (PROC14)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1,5 mg/m³	0,375	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,375	

8.3.10. Worker exposure Bulk transfers (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

8.3.11. Worker exposure Equipment cleaning and maintenance (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

8.4. Guidance to Downstream User (DU) to evaluate whether he works inside the boundaries set by the ES

8.4.1. Environment

Guidance - Environment	No exposure assessment presented for the environment

8.4.2. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

9. 09: Use in Agrochemicals - Professional

9.1. Title section

9. Use in Agrochemicals - Professional

Association ref code: CONC.18.FU.11

Environment		
GEN-09	General measures (skin irritants)	ERC8a, ERC8d, ESVOC SPERC 8.11a.v1
Worker		
CS15	General exposures (closed systems)	PROC1
CS16	General exposures (open systems)	PROC4
CS14	Bulk transfers	PROC8b
CS10	Spraying	PROC11
CS4	Dipping, immersion and pouring	PROC13
CS39	Equipment cleaning and maintenance	PROC8a

Processes, tasks, activities covered	Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal. Professional use
Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

9.2. Conditions of use affecting exposure

9.2.1. Control of environmental exposure: General measures (skin irritants) (ERC8a, ERC8d, ESVOC SPERC 8.11a.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ESVOC SPERC 8.11a.v1	Use in Agrochemicals: Professional (SU22)

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	Liquid, vapour pressure 0.5 - 10 kPa at STP

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	595751,881 t/yr
Covers daily exposures up to 8 hours (unless stated differently)	

Conditions and measures related to personal protection, hygiene and health evaluation

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	General measures (skin irritants)
Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	General measures (skin irritants)

9.2.2. Control of worker exposure: General exposures (closed systems) (PROC1)

PROC1	Use in closed process, no likelihood of exposure (no sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation

Handle substance within a closed system	
Use in closed process, no likelihood of exposure	

Other conditions affecting workers exposure

Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

9.2.3. Control of worker exposure: General exposures (open systems) (PROC4)

PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

9.2.4. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Ensure material transfers are under containment or extract ventilation. Clear lines prior to de-coupling.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

9.2.5. Control of worker exposure: Spraying (PROC11)

PROC11	Non industrial spraying

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Wear a respirator conforming to EN140 with Type A/P2 filter or better	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

9.2.6. Control of worker exposure: Dipping, immersion and pouring (PROC13)

PROC13	Treatment of articles by dipping and pouring

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Avoid carrying out activities involving exposure for more than 4 hours	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

9.2.7. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 1 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Avoid carrying out activities involving exposure for more than 1 hour	
Drain down system prior to equipment break-in or maintenance	
Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure	
Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

9.3. Exposure estimation and reference to its source

9.3.1. Environmental release and exposure General measures (skin irritants) (ERC8a, ERC8d, ESVOC SPERC 8.11a.v1)

Information for contributing exposure scenario
No additional information.

9.3.2. Worker exposure General exposures (closed systems) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,01 mg/m³	0,003	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,003	

9.3.3. Worker exposure General exposures (open systems) (PROC4)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

9.3.4. Worker exposure Bulk transfers (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

9.3.5. Worker exposure Spraying (PROC11)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	2 mg/m³	0,5	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,5	

9.3.6. Worker exposure Dipping, immersion and pouring (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3 mg/m³	0,75	Used ECETOC TRA model.

Sum RCR - Long-term - systemic effects		0,75	

9.3.7. Worker exposure Equipment cleaning and maintenance (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

9.4. Guidance to Downstream User (DU) to evaluate whether he works inside the boundaries set by the ES

9.4.1. Environment

Guidance - Environment	No exposure assessment presented for the environment

9.4.2. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

10. 10: Road and construction applications

10.1. Title section

10.Road and construction applications - Professional

Association ref code: CONC.20.LU.15

Environment		
GEN-10	General measures (skin irritants)	ERC8d, ERC8f, ESVOC SPERC 8.15.v1
Worker		
CS14	Bulk transfers	PROC8b
CS7	Small package filling	PROC9
CS98	Roller, spreader, flow application	PROC10
CS10	Spraying	PROC11
CS4	Dipping, immersion and pouring	PROC13
CS39	Equipment cleaning and maintenance	PROC8a

Processes, tasks, activities covered	Application of surface coatings and binders in road and construction activities, including paving uses, manual mastic and in the application of roofing and water-proofing membranes
Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

10.2. Conditions of use affecting exposure

10.2.1. Control of environmental exposure: General measures (skin irritants) (ERC8d, ERC8f, ESVOC SPERC 8.15.v1)

ERC8d	Wide dispersive outdoor use of processing aids in open systems
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)
ESVOC SPERC 8.15.v1	Road and construction applications: Professional (SU22)

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	Liquid, vapour pressure 0.5 - 10 kPa at STP

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	4486,582 t/yr
Covers daily exposures up to 8 hours (unless stated differently)	

Conditions and measures related to personal protection, hygiene and health evaluation

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	General measures (skin irritants)
Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	General measures (skin irritants)

10.2.2. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Product (article) characteristics

Concentration of substance in product	Limit the substance content in the product to 5 %

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Limit the substance content in the product to 5 %	
Ensure material transfers are under containment or extract ventilation. Clear lines prior to de-coupling.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
elevated temperature	

10.2.3. Control of worker exposure: Small package filling (PROC9)

PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product (article) characteristics	
Concentration of substance in product	Limit the substance content in the product to 5 %

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Limit the substance content in the product to 5 %	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
elevated temperature	

10.2.4. Control of worker exposure: Roller, spreader, flow application (PROC10)

PROC10	Roller application or brushing

Product (article) characteristics	
Concentration of substance in product	Limit the substance content in the product to 5 %

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Limit the substance content in the product to 5 %	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
elevated temperature	

10.2.5. Control of worker exposure: Spraying (PROC11)

PROC11	Non industrial spraying

Product (article) characteristics	
Concentration of substance in product	Limit the substance content in the product to 5 %

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Limit the substance content in the product to 5 %	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
elevated temperature	

10.2.6. Control of worker exposure: Dipping, immersion and pouring (PROC13)

PROC13	Treatment of articles by dipping and pouring

Product (article) characteristics

Concentration of substance in product	Limit the substance content in the product to 5 %

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Limit the substance content in the product to 5 %	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure

Outdoor	
elevated temperature	

10.2.7. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 1 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Without LEV	
Limit the substance content in the product to 5 %	
Drain down system prior to equipment break-in or maintenance	
Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure

Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

10.3. Exposure estimation and reference to its source

10.3.1. Environmental release and exposure General measures (skin irritants) (ERC8d, ERC8f, ESVOC SPERC 8.15.v1)

Information for contributing exposure scenario
No additional information.

10.3.2. Worker exposure Bulk transfers (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

10.3.3. Worker exposure Small package filling (PROC9)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

10.3.4. Worker exposure Roller, spreader, flow application (PROC10)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

10.3.5. Worker exposure Spraying (PROC11)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	2,8 mg/m³	0,7	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,7	

10.3.6. Worker exposure Dipping, immersion and pouring (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

10.3.7. Worker exposure Equipment cleaning and maintenance (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

10.4. Guidance to Downstream User (DU) to evaluate whether he works inside the boundaries set by the ES

10.4.1. Environment

Guidance - Environment	No exposure assessment presented for the environment

10.4.2. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

11. 11: Explosives manufacture & use

11.1. Title section

11.Explosives manufacture & use - Professional

Association ref code: CONC.38.LU.18

Environment		
GEN-11	General measures (skin irritants)	ERC8e, (ERC)
Worker		
CS15	General exposures (closed systems)	PROC1
CS15	General exposures (closed systems) + Batch process	PROC3
CS30	Mixing operations (open systems)	PROC5
CS14	Bulk transfers	PROC8b
CS39	Equipment cleaning and maintenance	PROC8a

Processes, tasks, activities covered	Covers exposures arising from the manufacture and use of slurry explosives (including materials transfer, mixing and charging) and equipment cleaning Professional use
Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

11.2. Conditions of use affecting exposure

11.2.1. Control of environmental exposure: General measures (skin irritants) (ERC8e, (ERC))

ERC8e	Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)
(ERC)	Release fractions defined by ERC

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	vapour pressure < 0.5 kPa at STP

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	306 t/yr
Covers daily exposures up to 8 hours (unless stated differently)	

Conditions and measures related to personal protection, hygiene and health evaluation

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	General measures (skin irritants)

11.2.2. Control of worker exposure: General exposures (closed systems) (PROC1)

PROC1	Use in closed process, no likelihood of exposure (no sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Continuous process	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation

Handle substance within a closed system	
No other specific measures identified	

Other conditions affecting workers exposure

Outdoor	
Assumes activities are at ambient temperature (unless stated differently)	

11.2.3. Control of worker exposure: General exposures (closed systems) + Batch process (PROC3)

PROC3	Use in closed batch process (synthesis or formulation) (with sampling)

Amount used (or contained in articles), frequency and duration of use/exposure

Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Provide closed or ventilated sample points.	
Handle substance within a closed system	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Assumes activities are at ambient temperature (unless stated differently)	
Outdoor	
Provide closed or ventilated sample points.	

11.2.4. Control of worker exposure: Mixing operations (open systems) (PROC5)

PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Indoor	
Assumes activities are at ambient temperature (unless stated differently)	

11.2.5. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Product (article) characteristics	
Concentration of substance in product	Limit the substance content in the product to 5 %

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 4 h/day
Continuous process	

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Ensure material transfers are under containment or extract ventilation. Clear lines prior to de-coupling.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

Other conditions affecting workers exposure	
Outdoor	
elevated temperature	

11.2.6. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers exposure up to (hours/event):	> 1 h/day

Conditions and measures related to personal protection, hygiene and health evaluation	
Without LEV	
Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)	
Drain down system prior to equipment break-in or maintenance	
Retain drain downs in sealed storage pending disposal or for subsequent recycle	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

Other conditions affecting workers exposure	
Indoor/Outdoor use.	
Assumes activities are at ambient temperature (unless stated differently)	

11.3. Exposure estimation and reference to its source

11.3.1. Environmental release and exposure General measures (skin irritants) (ERC8e, (ERC))

Information for contributing exposure scenario
No additional information.

11.3.2. Worker exposure General exposures (closed systems) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	0,01 mg/m³	0,003	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,003	

11.3.3. Worker exposure General exposures (closed systems) + Batch process (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	1 mg/m³	0,25	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,25	

11.3.4. Worker exposure Mixing operations (open systems) (PROC5)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

11.3.5. Worker exposure Bulk transfers (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

11.3.6. Worker exposure Equipment cleaning and maintenance (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0 mg/kg bodyweight/day	0	Qualitative approach used to conclude safe use
Inhalation - Long-term - systemic effects	3,5 mg/m³	0,875	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,875	

11.4. Guidance to Downstream User (DU) to evaluate whether he works inside the boundaries set by the ES

11.4.1. Environment

Guidance - Environment	No exposure assessment presented for the environment

11.4.2. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

12. 12: Use in Agrochemicals - Consumer

12.1. Title section

12.Use in Agrochemicals - Consumer

Association ref code: CONC.19.FU.11

Consumer		
GEN-12	General measures (skin irritants)	ERC8a, ERC8d, ESVOC SPERC 8.11b.v1
PC12	Fertilisers	PC12
PC22	Lawn and garden preparations, including fertilizers	PC22
PC27	Plant protection products	PC27

Processes, tasks, activities covered	Covers the consumer use in agrochemicals in liquid and solid forms. Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal. Consumer use
Assessment method	See Section 3.

12.2. Conditions of use affecting exposure

12.2.1. Control of consumer exposure: General measures (skin irritants) (ERC8a, ERC8d, ESVOC SPERC 8.11b.v1)

ERC8a	Wide dispersive indoor use of processing aids in open systems
ERC8d	Wide dispersive outdoor use of processing aids in open systems
ESVOC SPERC 8.11b.v1	Use in Agrochemicals: Consumer (SU21)

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	Liquid, vapour pressure 0.5 - 10 kPa at STP

Amount used (or contained in articles), frequency and duration of use/exposure

(unless otherwise stated),For each use event, covers use amounts up to (g):	37500
Covers skin contact area up to (cm2):	6600
Unless otherwise stated: ,Covers use up to (times/day of use):	4
Covers exposure up to (hours/event):	8

Other conditions affecting consumer exposure

Avoid contact with skin, eyes and clothes.	
Covers use at ambient temperatures.	
Covers use in room size of (m3):	20
Covers use under typical household ventilation.	

12.2.2. Control of consumer exposure: Fertilisers (PC12)

PC12	Fertilizers

Product (article) characteristics

Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	= hPa
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic.

Amount used (or contained in articles), frequency and duration of use/exposure

For each use event, covers use amounts up to (g):	<= 2500 g
Covers use up to (days/year):	<= 1 days/yr
Covers use up to (times/day of use):	1

Other conditions affecting consumer exposure

Outdoor use.	
Covers concentrations up to (%):(unless otherwise stated)	90 %

Covers skin contact area up to (cm2):	857,5
For each use event, assumes swallowed amount of (g):	0,3

12.2.3. Control of consumer exposure: Lawn and garden preparations, including fertilizers (PC22)

PC22	Lawn and garden preparations, including fertilizers

Product (article) characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Vapour pressure	= hPa
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic.

Other conditions affecting consumer exposure	
Products containing Sulfur in high percentages are sold for acidification of soil, to treat certain plant diseases (e.g. scab on potatoes) and as worm- deterrent (http://www.progreen.co.uk/index.php?c=61&p=132). The products are provided as prill (pellets) in bags of 1 kg	
Outdoor use.	
Covers concentrations up to (%):(unless otherwise stated)	90 %
Covers use up to (days/year):	1

12.2.4. Control of consumer exposure: Plant protection products (PC27)

PC27	Plant protection products

Product (article) characteristics	
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa
Concentration of substance in product	<= 100 %
Concentration of substance in product	(unless otherwise stated)
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic.

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to (g):	<= 2500 g
Covers use up to (days/year):	<= 1 days/yr
Covers use up to (times/day of use):	1

Other conditions affecting consumer exposure	
Outdoor use.	
Covers concentrations up to (%):(unless otherwise stated)	90 %
Covers use up to (days/year):	1
Covers skin contact area up to (cm2):	857,5
For each use event, assumes swallowed amount of (g):	0,3

12.3. Exposure estimation and reference to its source

12.3.1. Consumer exposure General measures (skin irritants) (ERC8a, ERC8d, ESVOC SPERC 8.11b.v1)

Information for contributing exposure scenario
No additional information.

12.3.2. Consumer exposure Fertilisers (PC12)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Oral - Long-term - systemic effects	0,08 mg/kg bodyweight/day	0,16	Used ECETOC TRA model.
Dermal - Long-term - systemic effects	0,39 mg/kg bodyweight/day	0,78	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,94	

12.3.3. Consumer exposure Lawn and garden preparations, including fertilizers (PC22)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Oral - Long-term - systemic effects	0,08 mg/kg bodyweight/day	0,16	Used ECETOC TRA model.

Dermal - Long-term - systemic effects	0,39 mg/kg bodyweight/day	0,78	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,94	

12.3.4. Consumer exposure Plant protection products (PC27)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Oral - Long-term - systemic effects	0,08 mg/kg bodyweight/day	0,16	Used ECETOC TRA model.
Dermal - Long-term - systemic effects	0,39 mg/kg bodyweight/day	0,78	Used ECETOC TRA model.
Sum RCR - Long-term - systemic effects		0,94	

12.4. Guidance to Downstream User (DU) to evaluate whether he works inside the boundaries set by the ES

12.4.1. Environment

Guidance - Environment	No exposure assessment presented for the environment

12.4.2. Health

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

End of document