ODJELJAK 1.: Identifikacija tvari/smjese i podaci o društvu/poduzeću

1.1. Identifikacijska oznaka proizvoda

Identifikacija preparata:

Trgovačko ime: PRIMER ADW

Trgovački kod: 582K

UFI: WYK1-H08D-G008-N88Y

1.2. Utvrđene relevantne uporabe tvari ili smjese i uporabe koje se ne preporučuju

Preporučana upotreba: Smola za učvršćivanje i izolaciju cementnih estriha; Samo za stručno upotrebljavanje

Nepreporučljiva upotreba: Nije namijenjeno potrošačima

1.3. Podaci o dobavljaču koji isporučuje sigurnosno-tehnički list

Tvrtka: FASSA Srl

Via Lazzaris, 3 - 31027 Spresiano (TV) - ITALY

Tel. +39 0422 7222

Fax +39 0422 887509

Odgovorna osoba: laboratorio.spresiano@fassabortolo.it

1.4. Broj telefona za izvanredna stanja

+3851 2348 342

ODJELJAK 2.: Identifikacija opasnosti



2.1. Razvrstavanje tvari ili smjese

Uredba (EC) br. 1272/2008 (CLP)

Flam. Liq. 2	Lako zapaljiva tekućina i para.
Acute Tox. 4	Štetno ako se udiše.
Skin Irrit. 2	Nadražuje kožu.
Eye Irrit. 2	Uzrokuje jako nadraživanje oka.
Resp. Sens. 1	Ako se udiše može izazvati simptome alergije ili astme ili poteškoće s disanjem.
Skin Sens. 1	Može izazvati alergijsku reakciju na koži.
Carc. 2	Sumnja na moguće uzrokovanje raka.
STOT SE 3	Može nadražiti dišni sustav.
STOT SE 3	Može izazvati pospanost ili vrtoglavicu.
STOT RE 2	Može uzrokovati oštećenje organa tijekom produljene ili ponavljane izloženosti.

Fizikalno-kemijski učinci štetni po ljudsko zdravlje i okoliš:

Nema ostalih rizika

2.2. Elementi označivanja

Uredba (EC) br. 1272/2008 (CLP):

Piktogrami i oznaka opasnosti



Opasnost

Oznake upozorenja

H225	Lako zapaljiva tekućina i para.
H315	Nadražuje kožu.
H317	Može izazvati alergijsku reakciju na koži.
H319	Uzrokuje jako nadraživanje oka.
H332	Štetno ako se udiše.
H334	Ako se udiše može izazvati simptome alergije ili astme ili poteškoće s disanjem.

H335	Može nadražiti dišni sustav.
H336	Može izazvati pospanost ili vrtoglavicu.
H351	Sumnja na moguće uzrokovanje raka.
H373	Može uzrokovati oštećenje organa tijekom produljene ili ponavljane izloženosti.

Oznake obavijesti

P210	Čuvati odvojeno od topline, vrućih površina, iskri, otvorenih plamena i ostalih izvora paljenja. Ne pušiti.
P261	Izbjegavati udisanje dima/plina/magle/pare/aerosola.
P280	Nositi zaštitne rukavice/zaštitno odijelo te zaštitu za oči/zaštitu za lice.
P304+P340	AKO SE UDIŠE: premjestiti osobu na svježi zrak i postaviti ju u položaj koji olakšava disanje.
P342+P311	Pri otežanom disanju: nazvati CENTAR ZA KONTROLU OTROVANJA/liječnika.
P370+P378	U slučaju požara, rabiti CO2 aparat za gašenje.

Posebna osiguranja:

EUH204 Sadrži izocianate. Može izazvati alergijsku reakciju.

Sadrži:

etil-acetat

4,4'-metilendifenil diizocijanat

izocijanova kiselina, polimetilenpolifenilen-ester, polimer s a-hidro-omega-hidroksipoli[oksi(metil-1,2-etandiil)]

Reakcijska smjesa 4,4'-metilendifenil diizocijanat i o-(p-izocijanatobenzil)fenil izocijanat

izocijanova kiselina, polimetilenpolifenilen-ester

Posebne odredbe prema Prilogu XVII REACH-a i naknadnih amandmana:

Od 24. kolovoza 2023. prije industrijske i profesionalne uporabe obvezno je odgovarajuće osposobljavanje.

2.3. Ostale opasnosti

Bez PBT-a, vPvB-a ili endokrinih disruptora prisutnih u koncentraciji > = 0,1 %.

Nema ostalih rizika

ODJELJAK 3.: Sastav/informacije o sastojcima

3.1. Tvari

Ne primjenjuje se.

3.2. Smjese

Identifikacija preparata: PRIMER ADW

Opasni sastojci u smislu CLP Uredbe koja se odnosi na razvrstavanje:

Količina	Naziv	Ident. Broj.	Klasifikacija	Broj registriranih slučajeva:
≥50 - <80 %	etil-acetat	CAS:141-78-6 EC:205-500-4 Index:607-022-00-5	Flam. Liq. 2, H225; Eye Irrit. 2, H319; STOT SE 3, H336, EUH066	01-2119475103-46-xxxx
≥20 - <30 %	izocijanova kiselina, polimetilenpolifenilen-ester, polimer s a-hidro-omega-hidroksipoli[oksi(metil-1,2-etandiil)]	CAS:53862-89-8 EC:670-234-1	Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 2, H351 STOT SE 3, H335 STOT RE 2, H373 Procjena akutne toksičnosti: ATE - Udisanje (Prašina/maglica): 1.5mg/l ATE - Udisanje (Pare): 11mg/l	
≥10 - <20 %	izocijanova kiselina, polimetilenpolifenilen-ester	CAS:9016-87-9 EC:618-498-9	Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 2, H351 STOT SE 3, H335 STOT RE 2, H373	

			Specifične granične vrijednosti koncentracije: 5% ≤ C < 100%: Skin Irrit. 2 H315 5% ≤ C < 100%: Eye Irrit. 2 H319 0.1% ≤ C < 100%: Resp. Sens. 1 H334 5% ≤ C < 100%: STOT SE 3 H335 Procjena akutne toksičnosti: ATE - Udisanje (Prašina/maglica): 1.5mg/l	
≥3 - <5 %	4,4'-metilendifenil diizocijanat	CAS:101-68-8 EC:202-966-0 Index:615-005-00-9	Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 2, H351 STOT SE 3, H335 STOT RE 2, H373 Specifične granične vrijednosti koncentracije: 5% ≤ C < 100%: Skin Irrit. 2 H315 5% ≤ C < 100%: Eye Irrit. 2 H319 0.1% ≤ C < 100%: Resp. Sens. 1 H334 5% ≤ C < 100%: STOT SE 3 H335 Procjena akutne toksičnosti: ATE - Udisanje (Prašina/maglica): 1.5mg/l	01-2119457014-47-xxxx
≥1 - <3 %	Reakcijska smjesa 4,4'-metilendifenil diizocijanat i o-(p-izocijanatobenzil)fenil izocijanat	EC:905-806-4	Carc. 2, H351 Acute Tox. 4, H332 STOT RE 2, H373 Eye Irrit. 2, H319 Skin Irrit. 2, H315 STOT SE 3, H335 Resp. Sens. 1, H334 Skin Sens. 1, H317 Procjena akutne toksičnosti: ATE - Udisanje (Pare): 11mg/l	01-2119457015-45-xxxx

ODJELJAK 4.: Mjere prve pomoći

4.1. Opis mjera prve pomoći

U slučaju kontakta sa kožom:

Smjesta skinuti zagađenu odjeću i ukloniti je na bezbjedan način.

Odmah oprati obilnom količinom tekuće vode i eventualno sapunom dijelove tijela koji su došli u dodir s proizvodom, čak i u slučaju da samo sumnjate da je došlo do kontakta.

Oprati čitavo tijelo (istuširati se ili okupati).

U slučaju kontakta sa očima:

U slučaju kontakta sa očima, ispirati oči vodom neko vrijeme, držati otvorene kapke, a potom zatražiti pomoć oftalmologa.

Zaštititi neozlijeđeno oko.

U slučaju gutanja:

Ne poticati povraćanje, obratiti se liječniku i pokazati listić o sigurnosti i oznaku kemijskog rizika.

U slučaju udisanja:

Izloženu osobu treba iznijeti na svježi zrak, držati je na toplom, a ista mora mirovati.

Ukoliko osoba nepravilno diše ili uopće ne diše, dati umjetno disanje.

Ukoliko se proguta, hitno zatražiti savjet liječnika i pokazati posudu ili naljepnicu.

4.2. Najvažniji simptomi i učinci, akutni i odgođeni

Simptomi i ucinci su u skladu s ocekivanjima od opasnosti kako je prikazano u 2. odjeljku.

4.3. Navod o potrebi za hitnom liječničkom pomoći i posebnom obradom

U slučaju nesreće ili slabosti smjesta se obratiti liječniku (ako je moguće, pokazati upute za uporabu ili sigurnosni list).

ODJELJAK 5.: Mjere za suzbijanje požara

5.1. Sredstva za gašenje

Prikladna sredstva za gašenje požara:

U slučaju požara, rabiti CO2 aparat za gašenje.

CO2, aparati za gašenje požara prahom, pjena, raspršivanje vode.

Sredstva za gašenje požara koja ne treba koristiti iz bezbijednosnih razloga:

Voda u mlazovima.

5.2. Posebne opasnosti koje proizlaze iz tvari ili smjese

Sagorijevanjem se oslobađaju teški dimovi.

Ne udisati plinove nastale eksplozijom i/ili izgaranjem (ugljikov monoksid i ugljikov dioksid, dušikove okside).

5.3. Savjeti za gasitelje požara

Koristiti prikladne dišne aparate.

Posebno pokupiti zaprljanu vodu, koja je korištena za gašenje požara. Ne bacati ovu vodu u kanalizacionu mrežu.

Neoštećene spremnike skloniti iz prostora neposredne opasnosti, ukoliko se to može izvršiti na bezbjedan način.

ODJELJAK 6.: Mjere kod slučajnog ispuštanja

6.1. Osobne mjere opreza, zaštitna oprema i postupci za izvanredna stanja

Za osobe koje se ne ubrajaju u interventno osoblje:

Koristiti sredstva za osobnu zaštitu.

Ukloniti svaki izvor plamena.

Ukoliko ste izloženi pari/prašini/aerosoli nosite dišne aparate.

Obezbjediti prikladno prozračivanje.

Koristiti prikladnu zaštitu dišnih organa.

Konzultirati mjere zaštite opisane u točkama 7. i 8.

Za interventno osoblje:

Koristiti sredstva za osobnu zaštitu.

6.2. Mjere zaštite okoliša

Spriječiti prodiranje u tlo/dublje slojeve zemlje. Spriječiti ulivanje u površinske vode ili u kanalizacionu mrežu.

U slučaju izlaska plina ili prodiranja u vodene tokove, tlo ili kanalizacionu mrežu, obavijestiti nadležna tijela.

6.3. Metode i materijal za sprečavanje širenja i čišćenje

Materijal je prikladan za skupljanje: inertni upijajući materijal (npr. pijesak, vermikulit)

Nakon što je proizvod sakupljen, isprati onečišćeno područje i predmete s vodom.

Zadržati vodu kojom ste izvršili pranje, pa je eliminirati.

6.4. Uputa na druge odjeljke

Pogledati također i paragrafe 8. i 13.

ODJELJAK 7.: Rukovanje i skladištenje

7.1. Mjere opreza za sigurno rukovanje

Izbjegavati dodir s kožom i očima, udisanje para i maglica.

Koristiti lokaliziranu ventilaciju.

Ne koristite prazne spremnike prije no što ih očistite.

Prije prijenosa proizvoda, uvjeriti se da u spremnicima nema ostataka nekompatibilnih tvari.

Savjeti o općoj higijeni na radnom mjestu:

Kontaminirana odjeća se smjesta mora zamijeniti prije ulaska u menze.

Ne konzumirati hranu i piće na radnom mjestu.

Pogledati i paragraf 8. u svezi sa preporučanim napravama za zaštitu.

7.2. Uvjeti sigurnog skladištenja, uzimajući u obzir moguće inkompatibilnosti

Čuvati spremnike dobro zatvorene na hladnom i dobro prozračenom mjestu daleko od izvorā topline.

Čuvati dalje od nezaštićenog plamena, iskrenja i izvora topline. Izbjegavati izravno izlaganje sunčevoj svjetlosti.

Držati podalje od hrane, pića i krmiva.

Inkompatibilne tvari:

Vidi točku 10.5

Upute za prostorije za skladištenje:

Hladno i adekvatno prozračeno.

7.3. Posebna krajnja uporaba ili uporabe

Preporuke

Vidi točku 1.2

Specifične otopine za industrijski sektor

Nema posebne upotrebe

ODJELJAK 8.: Nadzor nad izloženošću/osobna zaštita

8.1. Nadzorni parametri

Granične vrijednosti izloženosti na mjestu rada

etil-acetat

CAS: 141-78-6 OEL Tip ACGIH Dugoročno 400 ppm

				Napomene: URT and eye irr
	OEL Tip	UE		Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
	OEL Tip	MAK	Austrija	Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
	OEL Tip	MAK	Njemačka	Dugoročno 750 mg/m3 - 200 ppm; Kratkoročno 1500 mg/m3 - 400 ppm
	OEL Tip	VLEP	Belgija	Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
	OEL Tip	VLEP	Francuska	Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
	OEL Tip	VLEP	Italija	Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
	OEL Tip	VLEP	Rumunjska	Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 400 mg/m3 - 1468 ppm
	OEL Tip	TLV	Bugarska	Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
	OEL Tip	TLV	Češka	Dugoročno 700 mg/m3 - 191.1 ppm; Kratkoročno 900 mg/m3 - 245.7 ppm
	OEL Tip	VLA	Španjolska	Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 1460 mg/m3 - 400 ppm
	OEL Tip	ÁK	Mađarska	Dugoročno 734 mg/m3; Kratkoročno 1468 mg/m3
	OEL Tip	MAC	Nizozemska	Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
	OEL Tip	VLE	Portugal	Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
	OEL Tip	SUVA	Švicarska	Dugoročno 730 mg/m3 - 200 ppm; Kratkoročno 1470 mg/m3 - 400 ppm
	OEL Tip	WEL	U.K.	Dugoročno 730 mg/m3 - 200 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
	OEL Tip	GVI	Hrvatska	Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
	OEL Tip	AGW	Njemačka	Dugoročno 730 mg/m3 - 200 ppm; Kratkoročno 1460 mg/m3 - 400 ppm
	OEL Tip	NDS	Poljska	Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
	OEL Tip	MV	Slovenija	Dugoročno 734 mg/m3 - 200 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
	OEL Tip	IPRV	Litva	Dugoročno 500 mg/m3 - 150 ppm; Kratkoročno 1100 mg/m3 - 300 ppm
	OEL Tip	RV	Latvija	Dugoročno 200 mg/m3 - 54 ppm; Kratkoročno 1468 mg/m3 - 400 ppm
izocijanova kiselina, polimetilenpolifenilen-ester				
CAS: 9016-87-9	OEL Tip	MAK	Njemačka	Dugoročno 0.05 mg/m3; Kratkoročno 0.05 mg/m3 Napomene: Inhalable fraction , Skin Kratkoročno 0.1 mg/m3 Napomene: Inhalable fraction , Skin, Ceiling
	OEL Tip	AGW	Njemačka	Dugoročno 0.05 mg/m3; Kratkoročno 0.05 mg/m3 Napomene: Inhalable fraction , Skin Kratkoročno 0.1 mg/m3 Napomene: Inhalable fraction , Skin, Ceiling
4,4'-metilendifenil diizocijanat				
CAS: 101-68-8	OEL Tip	ACGIH		Dugoročno 0.005 ppm Napomene: Resp sens
	OEL Tip	UE		Dugoročno 0.006 mg/m3; Kratkoročno 0.012 mg/m3 Napomene: Skin; Dermal and respiratory sensitisation
	OEL Tip	MAK	Austrija	Dugoročno 0.05 mg/m3 - 0.005 ppm; Kratkoročno 0.1 mg/m3 - 0.001 ppm
	OEL Tip	MAK	Njemačka	Dugoročno 0.05 mg/m3; Kratkoročno 0.05 mg/m3 Napomene: Inhalable fraction and vapour, Skin Kratkoročno 0.1 mg/m3 Napomene: Inhalable fraction and vapour, Skin
	OEL Tip	VLEP	Belgija	Dugoročno 0.052 mg/m3 - 0.005 ppm
	OEL Tip	VLEP	Francuska	Dugoročno 0.1 mg/m3 - 0.01 ppm; Kratkoročno 0.2 mg/m3 - 0.02 ppm
	OEL Tip	VLEP	Rumunjska	Kratkoročno 0.15 mg/m3
	OEL Tip	TLV	Češka	Dugoročno 0.05 mg/m3; Kratkoročno 0.1 mg/m3
	OEL Tip	VLA	Španjolska	Dugoročno 0.005 mg/m3 - 0.052 ppm
	OEL Tip	ÁK	Mađarska	Dugoročno 0.05 mg/m3; Kratkoročno 0.05 mg/m3
	OEL Tip	AGW	Njemačka	Dugoročno 0.05 mg/m3; Kratkoročno 0.05 mg/m3 Napomene: Inhalable fraction and vapour, Skin Kratkoročno 0.1 mg/m3 Napomene: Inhalable fraction and vapour, Skin
	OEL Tip	NDS	Poljska	Dugoročno 0.03 mg/m3; Kratkoročno 0.09 mg/m3
	OEL Tip	MV	Slovenija	Dugoročno 0.05 mg/m3; Kratkoročno 0.05 mg/m3

				Napomene: Inhalable
				Dugoročno 0.005 ppm; Kratkoročno 0.005 ppm Napomene: Skin
	OEL Tip	IPRV	Litva	Dugoročno 0.05 mg/m3 - 0.005 ppm; Kratkoročno 0.1 mg/m3 - 0.001 ppm

Reakcijska smjesa 4,4'-metilendifenil diizocijanat i o-(p-izocijanatobenzil)fenil izocijanat

OEL Tip	TLV	Rumunjska	Kratkoročno 0.15 mg/m3
OEL Tip	NDS	Poljska	Dugoročno 0.03 mg/m3; Kratkoročno 0.09 mg/m3

Granične vrijednosti izloženosti PNEC

etil-acetat

CAS: 141-78-6

Putevi izloženosti: Morska voda; PNEC Ograničiti: 0.024 mg/l

Putevi izloženosti: Svježa voda; PNEC Ograničiti: 0.24 mg/l

Putevi izloženosti: Sedimenti morske vode; PNEC Ograničiti: 0.115 mg/kg

Putevi izloženosti: Sedimenti svježe vode; PNEC Ograničiti: 1.15 mg/kg

Putevi izloženosti: Mikroorganizmi u postrojenjima za obradu otpadnih voda (STP); PNEC Ograničiti: 650 mg/l

Putevi izloženosti: Tlo (poljoprivredno); PNEC Ograničiti: 0.148 mg/kg

Putevi izloženosti: Sekundarno trovanje; PNEC Ograničiti: 0.2 mg/kg

4,4'-metilendifenil diizocijanat

CAS: 101-68-8

Putevi izloženosti: Svježa voda; PNEC Ograničiti: 1 mg/l

Putevi izloženosti: Morska voda; PNEC Ograničiti: 0.1 mg/l

Putevi izloženosti: Mikroorganizmi u postrojenjima za obradu otpadnih voda (STP); PNEC Ograničiti: 1 mg/l

Putevi izloženosti: Tlo (poljoprivredno); PNEC Ograničiti: 1 mg/kg

Reakcijska smjesa 4,4'-metilendifenil diizocijanat i o-(p-izocijanatobenzil)fenil izocijanat

Putevi izloženosti: Svježa voda; PNEC Ograničiti: 0.003 mg/l

Putevi izloženosti: Morska voda; PNEC Ograničiti: 0.001 mg/l

Putevi izloženosti: Sedimenti svježe vode; PNEC Ograničiti: 11.7 mg/kg

Putevi izloženosti: Sedimenti morske vode; PNEC Ograničiti: 1.17 mg/kg

Putevi izloženosti: Zemlja; PNEC Ograničiti: 2.33 mg/kg

Izvedena razina bez učinka. (DNEL)

etil-acetat

CAS: 141-78-6

Putevi izloženosti: Ljudi inhalacijski; Učestalost izloženosti: Dugotrajni, sistemski učinci djelatnik: 734 mg/m3; Potrošač: 367 mg/m3

Putevi izloženosti: Ljudi inhalacijski; Učestalost izloženosti: Dugotrajni, lokalni učinci djelatnik: 734 mg/m3; Potrošač: 367 mg/m3

Putevi izloženosti: Ljudi inhalacijski; Učestalost izloženosti: Kratkotrajni, sistemski učinci djelatnik: 1468 mg/m3; Potrošač: 734 mg/m3

Putevi izloženosti: Ljudi inhalacijski; Učestalost izloženosti: Kratkotrajni, lokalni učinci djelatnik: 1468 mg/m3; Potrošač: 734 mg/m3

Putevi izloženosti: Ljudi dermalno; Učestalost izloženosti: Dugotrajni, sistemski učinci djelatnik: 63 mg/kg; Potrošač: 37 mg/kg

Putevi izloženosti: Ljudi oralno; Učestalost izloženosti: Dugotrajni, sistemski učinci Potrošač: 4.5 mg/kg

4,4'-metilendifenil diizocijanat

CAS: 101-68-8

Putevi izloženosti: Ljudi inhalacijski; Učestalost izloženosti: Kratkotrajni, lokalni učinci djelatnik: 0.1 mg/m3; Potrošač: 0.05 mg/m3

Putevi izloženosti: Ljudi inhalacijski; Učestalost izloženosti: Dugotrajni, lokalni učinci djelatnik: 0.05 mg/m3; Potrošač: 0.025 mg/m3

Reakcijska smjesa 4,4'-metilendifenil diizocijanat i o-(p-izocijanatobenzil)fenil izocijanat

Putevi izloženosti: Ljudi inhalacijski; Učestalost izloženosti: Kratkotrajni (akutni) Industrijski djelatnik: 0.1 mg/m3

Putevi izloženosti: Ljudi inhalacijski; Učestalost izloženosti: Dugotrajni (ponavljani) Industrijski djelatnik: 0.05 mg/m3

8.2. Nadzor nad izloženošću

Osigurati odgovarajuću ventilaciju. Kad je to razumno moguće, to se može postići upotrebom rezervne ventilacije i dobre opće aspiracije.

Zaštita očiju:

Čaše sa bočnom zaštitom (EN 16321).

Zaštita kože:

Osoblje treba nositi antistatičku odjeću od prirodnih vlakana ili sintetičkih vlakana otpornih na visoke temperature.

Zaštita za ruke:

Ne postoji materijal ili kombinacija materijala za rukavice koji bi mogli jamčiti neograničenu otpornost na bilo koji kemijski proizvod ili kombinaciju proizvoda.

Ako je riječ o duljem ili ponavljanom rukovanju, koristite se rukavicama otpornim na kemijske proizvode.

Prikladne rukavice tipa (EN 374/EN 16523); FKM (fluorirana guma): debljina> = 0,4 mm; vrijeme prodiranja> = 480 min. NBR (nitrilna guma): debljina> = 0,4 mm; vrijeme prodiranja> = 480 min

Izbor prikladnih rukavica ne ovisi samo o materijalu, nego i o drugim karakteristikama kvalitete koje se razlikuju od proizvođača do proizvođača, i o načinima i vremenu upotrebe smjese.

Zaštita pri disanju:

Ako su radnici izloženi koncentracijama višima od granice izloženosti, moraju upotrebljavati odgovarajuće certificirane respiratore.

Kombinirana filtrirajuća naprava (EN 14387): maska s filtrom A-P2.

Kontrola izlaganja u okolišu:

Vidi točku 6.2

Higijenske i tehničke mjere

Vidi odlomak 7.

ODJELJAK 9.: Fizikalna i kemijska svojstva

9.1. Informacije o osnovnim fizikalnim i kemijskim svojstvima

fizičko stanje: tekuće

Izgled: tekuće

Boja: tamnosmeđe

Miris: voćno

Talište/ledište: N.D.

Vrelište ili početno vrelište i raspon temperatura vrenja: N.D.

Zapaljivost: Proizvod je razvrstan kao Flam. Liq. 2 H225

Donja i gornja granica eksplozivnosti: N.D.

Plamište: < 23°C

Temperatura samozapaljenja: N.D.

Temperatura raspadanja: Ne primjenjuje se.

pH: Ne primjenjuje se.

Kinematička viskoznost: Ne primjenjuje se.

Topljivost u vodi: Ne primjenjuje se.

Topljivost u ulje: Ne primjenjuje se.

Koeficijent raspodjele n-oktanol/voda (logaritamska vrijednost): Ne primjenjuje se.

Tlak pare: N.D.

Gustoća i/ili relativna gustoća: Ne primjenjuje se.

Relativna gustoća pare: N.D. Ne primjenjuje se.

Svojstva čestica:

Veličina čestica: Ne primjenjuje se.

9.2. Ostale informacije

Explozivne osobine: Ne primjenjuje se.

Osobine oksidiranja: Ne primjenjuje se.

ODJELJAK 10.: Stabilnost i reaktivnost

10.1. Reaktivnost

Stabilan u normalnim uvjetima

10.2. Kemijska stabilnost

Stabilan u normalnim uvjetima

10.3. Mogućnost opasnih reakcija

Zbog djelovanja topline ili u slučaju požara može doći do oslobađanja ugljikovih oksida i para koji mogu biti štetni za zdravlje.

Držati podalje od oksidansa, vrlo lužnatih i vrlo kiselih materijala radi sprečavanja egzotermnih reakcija.

10.4. Uvjeti koje treba izbjegavati

Čuvati odvojeno od izvorā topline.

10.5. Inkompatibilni materijali

Izbjegavati dodir s oksidirajućim materijalima. Proizvod se može zapaliti.

Vidi točku 10.3

10.6. Opasni proizvodi raspadanja

Pri odgovarajućem skladištenju i rukovanju ne razvijaju se opasni proizvodi raspadanja.
Vidi točku 5.2

ODJELJAK 11.: Toksikološke informacije

11.1. Informacije o razredima opasnosti kako su definirani u Uredbi (EZ) br. 1272/2008

Podaci o toksičnosti proizvoda:

a) akutna toksičnost	Proizvod je razvrstan kao: Acute Tox. 4(H332)
b) kožno nagrizanje/nadraživanje	Proizvod je razvrstan kao: Skin Irrit. 2(H315)
c) teške očne ozljede/teško očno nadraživanje	Proizvod je razvrstan kao: Eye Irrit. 2(H319)
d) izazivanje kožne ili dišne preosjetljivosti	Proizvod je razvrstan kao: Resp. Sens. 1(H334), Skin Sens. 1(H317)
e) mutagenost zametnih stanica	Nije kategorizirano Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.
f) kancerogenost	Proizvod je razvrstan kao: Carc. 2(H351)
g) reproduktivna toksičnost	Nije kategorizirano Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.
h) Specifična toksičnost za ciljne organe (STOT) jednokratno izlaganje	Proizvod je razvrstan kao: STOT SE 3(H335), STOT SE 3(H336)
i) Specifična toksičnost za ciljne organe (STOT) opetovano izlaganje	Proizvod je razvrstan kao: STOT RE 2(H373)
j) opasnost u slučaju udisanja	Nije kategorizirano Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.

Podaci o toksičnosti glavnih sastojaka u proizvodu:

etil-acetat

CAS: 141-78-6	a) akutna toksičnost	LD50 Oralno Štakor 4934 mg/kg LD50 Koža Kunić > 20000 mg/kg LC50 Udisanje pare Štakor > 22.5 mg/l 6h

izocijanova kiselina, polimetilenpolifenilen-ester, polimer s a-hidro-omega-hidroksipoli[oksi(metil-1,2-etandiil)]

CAS: 53862-89-8	a) akutna toksičnost	ATE - Udisanje (Prašina/maglica): 1.5 mg/l ATE - Udisanje (Pare): 11 mg/l

izocijanova kiselina, polimetilenpolifenilen-ester

CAS: 9016-87-9	a) akutna toksičnost	ATE - Udisanje (Prašina/maglica): 1.5 mg/l LD50 Oralno Štakor > 10000 mg/kg LD50 Koža Kunić > 9400 mg/kg

4,4'-metilendifenil diizocijanat

CAS: 101-68-8	a) akutna toksičnost	ATE - Udisanje (Prašina/maglica): 1.5 mg/l LD50 Oralno Štakor > 5000 mg/kg LD50 Koža Kunić > 9400 mg/kg

Reakcijska smjesa 4,4'-metilendifenil diizocijanat i o-(p-izocijanatobenzil)fenil izocijanat

	a) akutna toksičnost	ATE - Udisanje (Pare): 11 mg/l

11.2. Informacije o drugim opasnostima

Svojstva endokrine disrupcije:

Bez drugih endokrinih disruptora prisutnih u koncentraciji > = 0,1 %

ODJELJAK 12.: Ekološke informacije

Primjeniti dobre radne postupke da se produkt ne oslobađa u okoliš.

12.1. Toksičnost

Eko-Toksikološke informacije:

Popis eko-toksikoloških svojstava proizvoda

Nije razvrstan kao opasan za okoliš

Nema raspoloživih podataka za proizvod

Popis sastojaka sa eko-toksikološkim svojstvima

etil-acetat

CAS: 141-78-6 a) Akutna otrovnost na vodene organizme: LC50 Ribe 230 mg/l 96h

a) Akutna otrovnost na vodene organizme: EC50 Daphnia 165 mg/l 48h

izocijanova kiselina, polimetilenpolifenilen-ester

CAS: 9016-87-9 a) Akutna otrovnost na vodene organizme: LC50 Ribe > 1000 mg/l 96h

a) Akutna otrovnost na vodene organizme: LC50 Daphnia > 1000 mg/l 24h

b) Hronična otrovnost na vodene organizme: NOEC Daphnia > 10 mg/l - 21d

a) Akutna otrovnost na vodene organizme: ErC50 Algae > 1640 mg/l 72h

4,4'-metilendifenil diizocijanat

CAS: 101-68-8 a) Akutna otrovnost na vodene organizme: LL50 Ribe > 100 mg/l 96h

a) Akutna otrovnost na vodene organizme: EC50 Daphnia > 1000 mg/l 24h

a) Akutna otrovnost na vodene organizme: EL50 Algae > 100 mg/l 72h

b) Hronična otrovnost na vodene organizme: NOEC Daphnia > 10 mg/l - 21d

12.2. Postojanost i razgradivost

Primjenjujte u skladu s dobrom profesionalnom praksom i ne ispuštajte proizvod u okoliš. Obavijestite mjerodavna tijela ako proizvod dospije u vodene tokove ili kanalizaciju ili ako zagadi tlo ili vegetaciju.

etil-acetat

CAS: 141-78-6 Brzo-biološki razgradiv

izocijanova kiselina, polimetilenpolifenilen-ester, polimer s a-hidro-omega-hidroksipoli[oksi(metil-1,2-etandiil)]

CAS: 53862-89-8 Nije brzo-biološki razgradiv

izocijanova kiselina, polimetilenpolifenilen-ester

CAS: 9016-87-9 Nije brzo-biološki razgradiv

4,4'-metilendifenil diizocijanat

CAS: 101-68-8 Nije brzo-biološki razgradiv

12.3. Bioakumulacijski potencijal

4,4'-metilendifenil diizocijanat

CAS: 101-68-8 Nije bioakumulativan

12.4. Pokretljivost u tlu

4,4'-metilendifenil diizocijanat

CAS: 101-68-8 Test: Log Koc; Vrijednost: 4.500

12.5. Rezultati procjene svojstava PBT i vPvB

Prema dostupnim podacima proizvod ne sadrži PBT/vPvB u postotku većem ≥ 0.1%.

12.6. Svojstva endokrine disrupcije

Bez drugih endokrinih disruptora prisutnih u koncentraciji > = 0,1 %

12.7. Ostali štetni učinci

Ne primjenjuje se.

ODJELJAK 13.: Zbrinjavanje

13.1. Metode obrade otpada

Regenerirati ako je moguće. Poslati ovlaštenim postrojenjima za odlaganje ili na spaljivanje pod kontroliranim uvjetima. Pri tome se pridržavati vrijedećih lokalnih i državnih regulativa.

Ne dopustiti prodor u kanalizaciju ili vodene tokove.

Zbrinite kontejnera onečišćenih proizvoda u skladu s lokalnim ili nacionalnim zakonskim odredbama.

Proizvod se nakon isteka roka trajanja mora odložiti prema propisima na snazi.

ODJELJAK 14.: Informacije o prijevozu



14.1. UN broj ili identifikacijski broj

1866

14.2. Ispravno otpremno ime prema UN-u

ADR-Naziv za otpremu: OTOPINA SMOLE, ZAPALJIVA

IATA-Naziv za otpremu: RESIN SOLUTION

IMDG-Naziv za otpremu: RESIN SOLUTION

14.3. Razred(i) opasnosti pri prijevozu

ADR-Razred: 3

IATA-Razred: 3

IMDG-Razred: 3

14.4. Skupina pakiranja

ADR-Grupa pakiranja: II

IATA-Grupa pakiranja: II

IMDG-Grupa pakiranja: II

14.5. Opasnosti za okoliš

Morski polutant: Ne

Zagađivači okoliša: Ne

IMDG-EMS: F-E, S-E

14.6. Posebne mjere opreza za korisnika

Ceste i Željeznica (ADR-RID):

ADR-Označavanje: 3

ADR - Identifikacijski broj opasnosti: 33

ADR-Posebne odredbe: 640C

ADR ograničenja prijevoza u tunelu:

Zrak (IATA):

IATA-Putnički zrakoplov: 353

IATA-Teretni zrakoplov: 364

IATA-Označavanje: 3

IATA-Sporedni opasnosti: -

IATA-Erg: 3L

IATA-Posebne odredbe: A3

More (IMDG):

IMDG-Skladištenje i rukovanje: Category B

IMDG-Segregacija: -

IMDG-Sporedni opasnosti -

IMDG-Posebne odredbe: -

14.7. Prijevoz morem u razlivenom stanju u skladu s instrumentima IMO-a

Ne primjenjuje se.

ODJELJAK 15.: Informacije o propisima

15.1. Propisi u području sigurnosti, zdravlja i okoliša/posebno zakonodavstvo za tvar ili smjesu

Direktiva 98/24/EC (Rizici koji nastaju od kemijskih agenasa na radu)

Direktiva 2000/39/EC (Granična vrijednost profesionalne izloženosti)

Direktiva 2010/75/EU

Uredba (EC) br. 1907/2006 (REACH)

Uredba (EC) br. 1272/2008 (CLP)

Uredba (EC) br. 790/2009 (ATP 1 CLP) i (EZ) br. 758/2013

Uredba (EZ) br. 2020/878

Uredba (EZ) br. 286/2011 (ATP 2 CLP)

Uredba (EZ) br. 618/2012 (ATP 3 CLP)

Uredba (EZ) br. 487/2013 (ATP 4 CLP)

Uredba (EZ) br. 944/2013 (ATP 5 CLP)

Uredba (EZ) br. 605/2014 (ATP 6 CLP)

Uredba (EZ) br. 2015/1221 (ATP 7 CLP)

Uredba (EZ) br. 2016/918 (ATP 8 CLP)

Uredba (EZ) br. 2016/1179 (ATP 9 CLP)

Uredba (EZ) br. 2017/776 (ATP 10 CLP)
Uredba (EZ) br. 2018/669 (ATP 11 CLP)
Uredba (EZ) br. 2018/1480 (ATP 13 CLP)
Uredba (EZ) br. 2019/521 (ATP 12 CLP)
Uredba (EZ) br. 2020/217 (ATP 14 CLP)
Uredba (EZ) br. 2020/1182 (ATP 15 CLP)
Uredba (EZ) br. 2021/643 (ATP 16 CLP)
Uredba (EZ) br. 2021/849 (ATP 17 CLP)
Uredba (EZ) br. 2022/692 (ATP 18 CLP)
Uredba (EU) no. 2023/707
Uredba (EZ) br. 2023/1434 (ATP 19 CLP)
Uredba (EZ) br. 2023/1435 (ATP 20 CLP)
Uredba (EZ) br. 2024/197 (ATP 21 CLP)
Uredba (EZ) br. 2024/2564 (ATP 22 CLP)
Uredba (EZ) br. 2024/2865
Uredba (EZ) br. 2025/1222 (ATP 23 CLP)

Ograničenja u vezi s produktom ili sadržajnim tvarima u skladu s Prilogom XVII Uredbe (EZ-a) 1907/2006 (REACH) i naknadne izmjene:

Ograničenja koja se odnose na proizvod: 3, 40

Ograničenja koja se odnose na sadržane tvari: 56, 74, 75

Odredbe prema direktivi 2012/18/EU (Seveso III)

Kategorija Seveso III prema dijelu 1. Priloga 1.	Donje granične količine opasnih tvari (u tonama) - male količine	Donje granične količine opasnih tvari (u tonama) - velike količine
proizvod pripada kategoriji: P5c	5000	50000

Uredba (EU) br. 649/2012 (Uredba PIC)

Nijedna tvar nije navedena

Njemačka klasifikacija opasnosti za vodu.

Klasa 3: iznimno opasni.

SVHC tvari:

Prema dostupnim podacima proizvod ne sadrži SVHC u postotku većem ≥ 0.1%.

Gornja granica vrijednosti hlapljivih organskih spojeva za EU (Direktiva 2004/42/EZ). Kat. A/h: 750 g/l; HOS < 750 g/l

15.2. Procjena kemijske sigurnosti

Procjena kemijske sigurnosti nije provedena za smjesu.

ODJELJAK 16.: Ostale informacije

Šifra	Opis
EUH066	Ponavljano izlaganje može prouzročiti sušenje ili pucanje kože.
H225	Lako zapaljiva tekućina i para.
H315	Nadražuje kožu.
H317	Može izazvati alergijsku reakciju na koži.
H319	Uzrokuje jako nadraživanje oka.
H332	Štetno ako se udiše.
H334	Ako se udiše može izazvati simptome alergije ili astme ili poteškoće s disanjem.
H335	Može nadražiti dišni sustav.
H336	Može izazvati pospanost ili vrtoglavicu.
H351	Sumnja na moguće uzrokovanje raka.
H373	Može uzrokovati oštećenje organa tijekom produljene ili ponavljane izloženosti.
H373	Može uzrokovati oštećenje organa tijekom produljene ili ponavljane izloženosti ako se udiše.
H373	Može uzrokovati oštećenje organa (dišni sustav) tijekom produljene ili ponavljane izloženosti ako se udiše.

Šifra	Razred opasnosti i kategorija opasnosti	Opis
2.6/2	Flam. Liq. 2	Zapaljiva tekućina, kategorija 2
3.1/4/Inhal	Acute Tox. 4	Akutna toksičnost (udisanje), kategorija 4
3.2/2	Skin Irrit. 2	Nadražujuće za kožu, kategorija 2
3.3/2	Eye Irrit. 2	Nadražujuće za oči, kategorija 2
3.4.1/1	Resp. Sens. 1	Izazivanje preosjetljivosti dišnih putova, kategorija 1

3.4.2/1	Skin Sens. 1	Izazivanje preosjetljivosti kože, kategorija 1
3.6/2	Carc. 2	Karcinogenost, Kategorija 2
3.8/3	STOT SE 3	Specifična toksičnost za ciljane organe – jednokratno izlaganje, Kategorija 3
3.9/2	STOT RE 2	Specifična toksičnost za ciljane organe – ponavljano izlaganje, Kategorija 2

Razvrstavanje i postupak razvrstavanja za smjese sukladno Uredbi (EZ) br. 1272/2008 (CLP):

Razvrstavanje prema Uredbi (EZ) br. 1272/2008	**Postupak razvrstavanja**
Flam. Liq. 2, H225	Na temelju rezultata ispitivanja
Acute Tox. 4, H332	Računska metoda
Skin Irrit. 2, H315	Računska metoda
Eye Irrit. 2, H319	Računska metoda
Resp. Sens. 1, H334	Računska metoda
Skin Sens. 1, H317	Računska metoda
Carc. 2, H351	Računska metoda
STOT SE 3, H335	Računska metoda
STOT SE 3, H336	Računska metoda
STOT RE 2, H373	Računska metoda

Ovaj dokument izradila je tehnički kompetentna osoba za SDS, te koja je prikladno za to osposobljena.

Glavni bibliografski izvori:

ECDIN – Informacijska mreža za ekološke podatke za kemikalije – Zajednički istraživački centar, Komisija Europskih zajednica

SAX's OPASNE OSOBINE INDUSTRIJSKIH TVARI- Osmo izdanje - Van Nostrand Reinold

Sigurnosno-tehnički listovi dobavljača sirovina.

Ovdje objavljne informacije se temelje na našem znanju u vrijeme gore navedenog datuma. Odnose se samo na navedene proizvode i ne predstavlja garanciju neke određene kvalitete.

Obaveza je korisnika da utvrdi da je ova informacija cjelovita i da odgovara specifičnoj upotrebi.

Ovaj MSDS poništava i zamjenjuje sva predhodna izdanja.

Legenda kratica i akronima upotrebljenih u sigurnosno-tehničkom listu:

ACGIH: Američka konferencija vladinih specijalista za industrijsku higijenu

ADR: Europski sporazum o međunarodnom cestovnom prijevozu opasnih tvari.

ATE: Procjena akutne toksičnosti

ATEmix: Procijenjena vrijednost akutne toksičnosti (Mješavine)

BEI: Indeks biološke izloženosti

CAS: CAS registarski broj (Američko kemijsko društvo)

CAV: Centar za otrove

CE: Europska zajednica

CLP: Razvrstavanje, označavanje, pakiranje.

CMR: Karcinogeno, Mutageno i Reprotoksično

COV: Hlapivi organski spoj

CSA: Procjena kemijske sigurnosti

CSR: Izvješće o kemijskoj sigurnosti

DNEL: Izvedena razina bez učinka.

EC50: Pulu maksimalna efektivna koncentracija

ECHA: Europska agencija za kemijske proizvode

EINECS: Europski propis postojećih trgovačkih kemijskih tvari.

ES: Scenario izloženosti

GefStoffVO: Propis o opasnim tvarima, Njemačka.

GHS: Globalno harmonizirani sustav razvrstavanja i označavanja kemikalija

IARC: Međunarodna agencija za istraživanja o karcinomu

IATA: Međunarodna udruga za zračni prijevoz.

IC50: Pulu maksimalna koncentracija inhibitora

IMDG: Međunarodni pomorski kodeks opasnog tereta.

LC50: Smrtna koncentracija u 50% slučajeva ispitivane populacije.

LD50: Smrtna doza u 50% slučajeva ispitivane populacije.

LDLo: Niska smrtonosna doza

N.A.: Nije primjenjivo

N/A: Nije primjenjivo

N/D: Nije definirano/Nije dostupno

N.D.: Nije dostupno

NIOSH: Državni institut za zaštitu na radu
NOAEL: Razina bez uočenih štetnih učinaka
OSHA: Upravljanje zaštitom na radu
PBT: Persistentno, bioakumulativno i toksično
PGK: Upute za pakiranje
PNEC: Predviđena koncentracija bez učinka.
PSG: Putnici
RID: Propis o međunarodnom prijevozu opasnih tvari željeznicom
STEL: Granica kratkotrajne izloženosti.
STOT: Toksičnost za ciljani organ.
TLV: Granična vrijednost praga.
TLV-TWA: Granična vrijednost praga za vremenski ponderirani prosjek. (ACGIH standard)
vPvB: Vrlo persistentno, vrlo bioakumulativno
WGK: Njemačka klasifikacija opasnosti za vodu.

Odlomci promijenjeni u odnosu na prethodnu reviziju:

- Sigurnosno-tehničkog lista
- ODJELJAK 1.: Identifikacija tvari/smjese i podaci o društvu/poduzeću
- ODJELJAK 2.: Identifikacija opasnosti
- ODJELJAK 3.: Sastav/informacije o sastojcima
- ODJELJAK 7.: Rukovanje i skladištenje
- ODJELJAK 8.: Nadzor nad izloženošću/osobna zaštita
- ODJELJAK 9.: Fizikalna i kemijska svojstva
- ODJELJAK 11.: Toksikološke informacije
- ODJELJAK 12.: Ekološke informacije
- ODJELJAK 14.: Informacije o prijevozu
- ODJELJAK 15.: Informacije o propisima
- ODJELJAK 16.: Ostale informacije

Ethyl acetate

Substance identification
Chemical Name: Ethyl acetate
CAS number: 141-78-6

ETHYL ACETATE

ES 1: Cosmetics, personal care products (PC39); User for consumers (SU21).
ES 2: Filling of drums and small packages (CS6); INDUSTRIAL USES (SU3).
ES 3: Formulation or repackaging (F); INDUSTRIAL USES (SU3).
ES 4: Use of non-reactive processing aid at industrial site (no inclusion in article) (ERC4); Industrial uses (su3).; Extraction agents (PC40).
ES 5: PROFESSIONAL APPLICATION OF COATINGS AND INKS; INDUSTRIAL USES (SU3).
ES 6: Use as laboratory reagent (PROC15); Industrial uses (su3).; Industrial use.
ES 7: Use in cleaning products (GEST4_I, GEST4_P, GEST4_C); INDUSTRIAL USES (SU3).
ES 8: Use in lubricants (GEST6_I, GEST6_P, GEST6_C); INDUSTRIAL USES (SU3).
ES 9: Professional application of coatings and inks (14); INDUSTRIAL USES (SU3). Covers use in coatings (paints, inks, adhesives, etc.) including exposures during use (receipt of material, storage, preparation and transfer of bulk and semi-bulk products, application by spray, roller or spreader, dipping , flow, fluidized bed on production lines and film formation), the cleaning and maintenance of the equipment and the associated laboratory activities [GES3_I].
ES 10: Use as laboratory reagent (PROC15);; Industrial uses (su3).; Professional (G27).
ES 11: Use in agrochemical products (GEST11_P, GEST11_C); INDUSTRIAL USES (SU3).
ES 12: Use in detergent products (GEST4_I, GEST4_P, GEST4_C).
ES 13: Use in lubricants (GEST6_I, GEST6_P, GEST6_C)
ES 14: Adhesives, Sealants (PC1); Use in coatings (GEST3_I, GEST3_P, GEST3_C).

ES 5: PROFESSIONAL APPLICATION OF COATINGS AND INKS (17); INDUSTRIAL USES (SU3).

5.1. USE AT INDUSTRIAL SITES

Environment
SC 1: Use of non-reactive processing aid at industrial site (no inclusion in article) ERC4

Worker
SC 2: Generalized exposures (closed systems) PROC1
SC 3: Generalized exposures (closed systems); Use in closed systems, with sample taking PROC2
SC 4: Film formation - forced drying (50 -100°C). Stove (>100°C), Curing by UV/EB radiation PROC2
SC 5: Mixing operations, Generalized exposures PROC3
SC 6: Film formation, air drying PROC4
SC 7: Preparation of material for application, Mixing operations (open systems) PROC5
SC 8: Spraying (automatic/robotic) PROC7
SC 9: Manual spraying PROC7
SC 10: Material transfers, Non-Specialized site PROC8a
SC 11: Material transfers, Specialized site PROC8b
SC 12: Roller, diffusion, flow application PROC10
SC 13: Immersion, dipping and pouring PROC13
SC 14: Laboratory activities PROC15
SC 15: Material transfers, Drum/batch transfers, Transfer from/pour from containers PROC9
SC 16: Production or preparation of articles by tabletting, compression, extrusion or pelletisation. PROC14

5.2. CONDITIONS OF USE THAT AFFECT EXPOSURE

5.2.1 Environmental exposure control: Use of non-reactive processing aid at industrial site (no inclusion in article) (ERC4)

Amount used (or contained in articles), frequency and duration of use/exposure
Daily amount per site: ≤ 1 t/day
Annual amount per site: ≤ 300 t/year

Organizational and technical measures and conditions
A wastewater treatment plant is expected.
Assumed domestic sewage treatment plant flow: ≥ 2E3 m³/day

Conditions and measures for waste treatment (including the article of waste)
Waste treatment: Dispose of waste products or used containers according to local regulations.

Other conditions affecting environmental exposure
Water flow on the receiving surface: 18,000 m³/g

5.2.2. Worker Exposure Control: Chemical production or refinement in closed processes without likelihood of exposure or in processes with equivalent containment conditions (PROC1)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.3. Worker Exposure Control: Chemical production or refinery in closed process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.4. Worker Exposure Control: Chemical production or refinery in closed process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.5. Worker Exposure Control: Chemical production or formulation in closed batch processes, with occasional controlled exposure or processes with equivalent containment conditions (PROC3)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.6. Worker Exposure Control: Production of chemicals with the possibility of exposure (PROC4)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 90%
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.7. Worker Exposure Control: Mixing or blending in batch processes (PROC5)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 90%
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.8. Worker Exposure Control: Industrial spraying (PROC7)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 95%
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.9. Worker Exposure Control: Industrial spraying (PROC7)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 95%
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.10. Worker Exposure Control: Transfer of a substance or a preparation (filling/emptying) at non-dedicated facilities (PROC8a)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 90%
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.11. Worker Exposure Control: Transfer of a substance or a mixture (charging/discharging) at dedicated facilities (PROC8b)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 95%
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.12. Worker Exposure Control: Application with rollers or brushes (PROC10)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 90%
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.13. Worker Exposure Control: Treatment of articles by dipping and pouring (PROC13)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 90%
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.14. Worker Exposure Control: Use as laboratory reagents (PROC15)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.15. Worker Exposure Control: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 90%
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.16. Worker Exposure Control: Tableting, compression, extrusion, pelletising, granulation (PROC14)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 90%
Provide a basic level of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

5.3.1. Environmental release and exposure: Use of non-reactive processing aid at industrial site (no inclusion in article) (ERC4)

Route release	Release rate	Method for estimating for release
water	20 kg/day	Estimated release factor
air	980 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Protection target	Estimated exposure	RCR
Fresh water	0.119 mg/l (EUSES v2.1)	0.495
freshwater sediments	0.708 mg/kg dry weight (EUSES v2.1)	0.616
Sea water	0.012 mg/l (EUSES v2.1)	0.495
Marine sediment	0.071 mg/kg dry weight (EUSES v2.1)	0.617
Sewage treatment plant	1.184 mg/l (EUSES v2.1)	< 0.01
Farmland	0.081 mg/kg dry weight (EUSES v2.1)	0.547
Prey for predators (freshwater)	1.469 mg/kg dry weight (EUSES v2.1)	< 0.01
Prey for predators (marine water)	0.148 mg/kg dry weight (EUSES v2.1)	< 0.01
Main predator prey (marine water)	0.031 mg/kg dry weight (EUSES v2.1)	< 0.01
Prey for Predators (Terrestrial)	0.028 mg/kg dry weight (EUSES v2.1)	< 0.01

5.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	0.037 mg/m³ (ECETOC TRA worker v3)	< 0.01
inhalation	systemic	Short term	0.147 mg/m³ (ECETOC TRA worker v3)	< 0.01
inhalation	local	Long-term	0.037 mg/m³ (ECETOC TRA worker v3)	< 0.01
inhalation	local	Short term	0.147 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	Long-term	0.034 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	Long-term	/	< 0.01

5.3.3. Worker exposure: Chemical production or refinery in closed process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	systemic	Short term	361.7 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	local	Short term	361.7 mg/m³ (ECETOC TRA worker v3)	0.25
dermal	systemic	Long-term	1.37 mg/kg bw/day (ECETOC TRA worker v3)	0.022
combined routes	systemic	Long-term	/	0.147

5.3.4. Worker exposure: Chemical production or refinery in closed process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	systemic	Short term	361.7 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	local	Short term	361.7 mg/m³ (ECETOC TRA worker v3)	0.25
dermal	systemic	Long-term	1.37 mg/kg bw/day (ECETOC TRA worker v3)	0.022
combined routes	systemic	Long-term	/	0.147

5.3.5. Worker exposure: Chemical production or formulation in closed batch processes, with occasional controlled exposure or processes with equivalent containment conditions (PROC3)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	183.5 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	systemic	Short term	734.2 mg/m³ (ECETOC TRA worker v3)	0.5
inhalation	local	Long-term	183.5 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Short term	734.2 mg/m³ (ECETOC TRA worker v3)	0.5
dermal	systemic	Long-term	0.69 mg/kg bw/day (ECETOC TRA worker v3)	0.011
combined routes	systemic	Long-term	/	0.261

5.3.6. Worker exposure: Production of chemicals with the possibility of exposure (PROC4)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	36.71 mg/m³ (ECETOC TRA worker v3)	0.05
inhalation	systemic	Short term	146.8 mg/m³ (ECETOC TRA worker v3)	0.1
inhalation	local	Long-term	36.71 mg/m³ (ECETOC TRA worker v3)	0.05
inhalation	local	Short term	146.8 mg/m³ (ECETOC TRA worker v3)	0.1
dermal	systemic	Long-term	6.86 mg/kg bw/day (ECETOC TRA worker v3)	0.109
combined routes	systemic	Long-term	/	0.159

5.3.7. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	systemic	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	local	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
dermal	systemic	Long-term	13.71 mg/kg bw/day (ECETOC TRA worker v3)	0.218
combined routes	systemic	Long-term	/	0.343

5.3.8. Worker exposure: Industrial spraying (PROC7)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	systemic	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	local	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
dermal	systemic	Long-term	42.86 mg/kg bw/day (ECETOC TRA worker v3)	0.68
combined routes	systemic	Long-term	/	0.805

5.3.9. Worker exposure: Industrial spraying (PROC7)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	systemic	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	local	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
dermal	systemic	Long-term	42.86 mg/kg bw/day (ECETOC TRA worker v3)	0.68
combined routes	systemic	Long-term	/	0.805

5.3.10. Worker exposure: Transfer of a substance or a preparation (filling/emptying) at non-dedicated facilities (PROC8a)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	systemic	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	local	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
dermal	systemic	Long-term	13.71 mg/kg bw/day (ECETOC TRA worker v3)	0.218
combined routes	systemic	Long-term	/	0.343

5.3.11. Worker exposure: Transfer of a substance or a mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	27.53 mg/m³ (ECETOC TRA worker v3)	0.038
inhalation	systemic	Short term	110.1 mg/m³ (ECETOC TRA worker v3)	0.075
inhalation	local	Long-term	27.53 mg/m³ (ECETOC TRA worker v3)	0.038
inhalation	local	Short term	110.1 mg/m³ (ECETOC TRA worker v3)	0.075
dermal	systemic	Long-term	13.71 mg/kg bw/day (ECETOC TRA worker v3)	0.218
combined routes	systemic	Long-term	/	0.255

5.3.12. Worker exposure: Application with rollers or brushes (PROC10)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	systemic	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	local	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
dermal	systemic	Long-term	27.43 mg/kg bw/day (ECETOC TRA worker v3)	0.435
combined routes	systemic	Long-term	/	0.56

5.3.13. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	systemic	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	local	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
dermal	systemic	Long-term	13.71 mg/kg bw/day (ECETOC TRA worker v3)	0.218
combined routes	systemic	Long-term	/	0.343

5.3.14. Worker exposure: Use as laboratory reagents (PROC15)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	183.5 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	systemic	Short term	734.2 mg/m³ (ECETOC TRA worker v3)	0.5
inhalation	local	Long-term	183.5 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Short term	734.2 mg/m³ (ECETOC TRA worker v3)	0.5
dermal	systemic	Long-term	0.34 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	Long-term	/	0.255

5.3.15. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	73.42 mg/m³ (ECETOC TRA worker v3)	0.1
inhalation	systemic	Short term	293.6 mg/m³ (ECETOC TRA worker v3)	0.2
inhalation	local	Long-term	73.42 mg/m³ (ECETOC TRA worker v3)	0.1
inhalation	local	Short term	293.6 mg/m³ (ECETOC TRA worker v3)	0.2
dermal	systemic	Long-term	6.86 mg/kg bw/day (ECETOC TRA worker v3)	0.109
combined routes	systemic	Long-term	/	0.209

5.3.16. Worker exposure: Tableting, compression, extrusion, pelletising, granulation (PROC14)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	systemic	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	local	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
dermal	systemic	Long-term	3.43 mg/kg bw/day (ECETOC TRA worker v3)	0.054
combined routes	systemic	Long-term	/	0.179

5.4. GUIDANCE FOR DOWNSTREAM USERS TO ASSESS WHETHER THEY COMPLY WITH THE LIMITS SET BY THE EXPOSURE SCENARIO

Guidance to check compliance with the exposure scenario: https://echa.europa.eu/

ES 9: PROFESSIONAL APPLICATION OF COATINGS AND INKS (14); INDUSTRIAL USES (SU3). COVERS USE IN COATINGS (PAINTS, INKS, ADHESIVES, ETC.) INCLUDING EXPOSURES DURING USE (RECEIPT OF MATERIAL, STORAGE, PREPARATION AND TRANSFER OF BULK AND SEMI-BULK PRODUCTS, APPLICATION BY SPRAY, ROLLER OR SPREADER, DIPPING , FLOW, FLUIDIZED BED ON PRODUCTION LINES AND FILM FORMATION), THE CLEANING AND MAINTENANCE OF THE EQUIPMENT AND THE ASSOCIATED LABORATORY ACTIVITIES [GES3_I].

9.1. WIDE DISPERSIVE USE BY PROFESSIONAL WORKERS

Environment
SC 1: Wide dispersive use of non-reactive processing aid (no inclusion into the article, outdoor) ERC8d

Worker
SC 3: Generalized exposures (closed systems) PROC1
SC 4: Filling of equipment from drums and containers PROC2
SC 5: Generalized exposures (closed systems), Use in closed systems PROC2
SC 6: Preparation of material for application, Generalized exposures PROC3
SC 7: Film formation - air drying, Indoor use PROC4
SC 8: Film formation - air drying, Outdoor use PROC4
SC 9: Preparation of material for application, Indoor use PROC5
SC 10: Preparation of material for application, Outdoor use PROC5
SC 11: Material transfers, Drum/batch transfers, Non-Specialized site PROC8a
SC 12: 12 Material Transfers, Drum/batch transfers, specialized site PROC8b
SC 13: Roller, diffusion, flow application, Indoor use PROC10
SC 14: Roller, diffusion, flow application, Outdoor use PROC10
SC 15: Manual spraying, Indoor use PROC11
SC 16: Manual spraying, Outdoor use PROC11
SC 17: Immersion, dipping and pouring, Indoor use PROC13
SC 18: Immersion, dipping and pouring, Outdoor use PROC13
SC 19: Laboratory activities PROC15
SC 20: Hand application - finger paints, crayons, stickers, Indoor use PROC19
SC 21: Hand application - finger paints, crayons, stickers, Outdoor use PROC19

9.2. CONDITIONS OF USE THAT AFFECT EXPOSURE

9.2.1 Environmental exposure control: Wide dispersive use of non-reactive processing aid (no inclusion into the article, outdoor) (ERC8d)

Organizational and technical measures and conditions
A wastewater treatment plant is expected.

Conditions and measures for waste treatment (including the article of waste)
Waste treatment: Dispose of waste products or used containers according to local regulations.

9.2.3. Worker Exposure Control: Chemical production or refinement in closed processes without likelihood of exposure or in processes with equivalent containment conditions (PROC1)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a basic level of general ventilation (1 to 3 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.4. Worker Exposure Control: Chemical production or refinery in closed process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a basic level of general ventilation (1 to 3 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.5. Worker Exposure Control: Chemical production or refinery in closed process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a basic level of general ventilation (1 to 3 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.6. Worker Exposure Control: Chemical production or formulation in closed batch processes, with occasional controlled exposure or processes with equivalent containment conditions (PROC3)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a basic level of general ventilation (3 to 5 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.7. Worker Exposure Control: Production of chemicals with the possibility of exposure (PROC4)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 80%
Provide a basic level of general ventilation (3 to 5 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.8. Worker Exposure Control: Production of chemicals with the possibility of exposure (PROC4)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.9. Worker Exposure Control: Mixing or blending in batch processes (PROC5)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 80%
Provide a basic level of general ventilation (3 to 5 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.10. Worker Exposure Control: Mixing or blending in batch processes (PROC5)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Conditions and measures for personal protection, hygiene and health assessment
Wear suitable respirator.
For more information, refer to Section 8 of the SDS (safety data sheet).
Inhalation - minimum yield of 90%

Other conditions affecting worker exposure
Indoor and outdoor use: Outdoor use
Temperature: Process temperature up to 40°C is assumed

9.2.11. Worker Exposure Control: Transfer of a substance or a preparation (filling/emptying) at non-dedicated facilities (PROC8a) (PROC8b)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 90%
Provide a basic level of general ventilation (3 to 5 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.12. Worker Exposure Control: Transfer of a substance or a mixture (charging/discharging) at dedicated facilities (PROC8b)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 90%
Provide a basic level of general ventilation (1 to 3 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.13. Worker Exposure Control: Application with rollers or brushes (PROC10)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 80%
Provide a basic level of general ventilation (1 to 3 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.14. Worker Exposure Control: Application with rollers or brushes (PROC10)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Conditions and measures for personal protection, hygiene and health assessment
Wear suitable respirator.
For more information, refer to Section 8 of the SDS (safety data sheet).
Inhalation - minimum yield of 90%

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.15. Worker Exposure Control: Non-industrial spray application (PROC11)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 80%
Provide a basic level of general ventilation (3 to 5 air changes per hour).

Conditions and measures for personal protection, hygiene and health assessment
Wear suitable gloves tested to EN374.
If skin contamination is expected to extend to other parts of the body, these parts should also be protected with impermeable clothing equivalent to that described for the hands.
For more information, refer to Section 8 of the SDS (safety data sheet).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.16. Worker Exposure Control: Non-industrial spray application (PROC11)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Conditions and measures for personal protection, hygiene and health assessment
Wear suitable gloves tested to EN374.
If skin contamination is expected to extend to other parts of the body, these parts should also be protected with impermeable clothing equivalent to that described for the hands.
For more information, refer to Section 8 of the SDS (safety data sheet).
Wear suitable respirator.
For more information, refer to Section 8 of the SDS (safety data sheet).
Inhalation - minimum yield of 90%

Other conditions affecting worker exposure
Indoor and outdoor use: Outdoor use
Temperature: Process temperature up to 40°C is assumed

9.2.17. Worker Exposure Control: Treatment of articles by dipping and pouring (PROC13)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a good standard of general ventilation (from 5 to 10 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.18. Worker Exposure Control: Treatment of articles by dipping and pouring (PROC13)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Conditions and measures for personal protection, hygiene and health assessment
Wear suitable respirator.
For more information, refer to Section 8 of the SDS (safety data sheet).
Inhalation - minimum yield of 90%

Other conditions affecting worker exposure
Indoor and outdoor use: Outdoor use
Temperature: Process temperature up to 40°C is assumed

9.2.19. Worker Exposure Control: Use as laboratory reagents (PROC15)

Product features (article)
Covers concentrations up to 100%.

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a basic level of general ventilation (1 to 3 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.20. Worker Exposure Control: Hand-mixing with direct contact and only PPE available (PROC19)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a good standard of general ventilation (from 5 to 10 air changes per hour).

Conditions and measures for personal protection, hygiene and health assessment
Wear suitable gloves tested to EN374.
If skin contamination is expected to extend to other parts of the body, these parts should also be protected with impermeable clothing equivalent to that described for the hands.
For more information, refer to Section 8 of the SDS (safety data sheet).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.2.21. Worker Exposure Control: Hand-mixing with direct contact and only PPE available (PROC19)

Product features (article)
Covers concentrations up to 5 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Conditions and measures for personal protection, hygiene and health assessment
Wear suitable gloves tested to EN374.
If skin contamination is expected to extend to other parts of the body, these parts should also be protected with impermeable clothing equivalent to that described for the hands.
For more information, refer to Section 8 of the SDS (safety data sheet).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

9.3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

9.3.1. Environmental release and exposure: Wide dispersive use of non-reactive processing aid (no inclusion into the article, outdoor) (ERC8d)

Route release	Release rate	Method for estimating for release
water	0.014 kg/day	Estimated release factor
air	980 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Protection target	Estimated exposure	RCR
Fresh water	0.000396 mg/l (EUSES v2.1)	< 0.01
freshwater sediments	0.00236 mg/kg dry weight (EUSES v2.1)	< 0.01
Sea water	0.0000597 mg/l (EUSES v2.1)	< 0.01
Marine sediment	0.000356 mg/kg dry weight (EUSES v2.1)	< 0.01
Sewage treatment plant	0.000805 mg/l (EUSES v2.1)	< 0.01
Farmland	0.000131 mg/kg dry weight (EUSES v2.1)	< 0.01
Prey for predators (freshwater)	0.011 mg/kg wet weight (EUSES v2.1)	< 0.01
Prey for predators (marine water)	0.00167 mg/kg wet weight (EUSES v2.1)	< 0.01
Main predator prey (marine water)	0.00158 mg/kg wet weight (EUSES v2.1)	< 0.01
Prey for Predators (Terrestrial)	0.000114 mg/kg wet weight (EUSES v2.1)	< 0.01

9.3.3. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	0.367 mg/m³ (ECETOC TRA worker v3)	< 0.01
inhalation	systemic	Short term	1.468 mg/m³ (ECETOC TRA worker v3)	< 0.01
inhalation	local	Long-term	0.367 mg/m³ (ECETOC TRA worker v3)	< 0.01
inhalation	local	Short term	1.468 mg/m³ (ECETOC TRA worker v3)	< 0.01
dermal	systemic	Long-term	0.034 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	Long-term	/	< 0.01

9.3.4. Worker exposure: Chemical production or refinery in closed process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	183.5 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	systemic	Short term	734.2 mg/m³ (ECETOC TRA worker v3)	0.5
inhalation	local	Long-term	183.5 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Short term	734.2 mg/m³ (ECETOC TRA worker v3)	0.5
dermal	systemic	Long-term	1.37 mg/kg bw/day (ECETOC TRA worker v3)	0.022
combined routes	systemic	Long-term	/	0.272

9.3.5. Worker exposure: Chemical production or refinery in closed process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	183.5 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Short term	734.2 mg/m³ (ECETOC TRA worker v3)	0.5
inhalation	local	Long-term	183.5 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	systemic	Short term	734.2 mg/m³ (ECETOC TRA worker v3)	0.5
dermal	systemic	Long-term	1.37 mg/kg bw/day (ECETOC TRA worker v3)	0.022
combined routes	systemic	Long-term	/	0.272

9.3.6. Worker exposure: Chemical production or formulation in closed batch processes, with occasional controlled exposure or processes with equivalent containment conditions (PROC3)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	systemic	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
inhalation	local	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	local	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
dermal	systemic	Long-term	0.69 mg/kg bw/day (ECETOC TRA worker v3)	0.011
combined routes	systemic	Long-term	/	0.361

9.3.7. Worker exposure: Production of chemicals with the possibility of exposure (PROC4)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	128.4 mg/m³ (ECETOC TRA worker v3)	0.175
inhalation	systemic	Short term	513.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	local	Long-term	128.4 mg/m³ (ECETOC TRA worker v3)	0.175
inhalation	local	Short term	513.9 mg/m³ (ECETOC TRA worker v3)	0.35
dermal	systemic	Long-term	6.86 mg/kg bw/day (ECETOC TRA worker v3)	0.109
combined routes	systemic	Long-term	/	0.284

9.3.8. Worker exposure: Production of chemicals with the possibility of exposure (PROC4)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	systemic	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
inhalation	local	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	local	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
dermal	systemic	Long-term	6.86 mg/kg bw/day (ECETOC TRA worker v3)	0.109
combined routes	systemic	Long-term	/	0.459

9.3.9. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	systemic	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
inhalation	local	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	local	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
dermal	systemic	Long-term	13.71 mg/kg bw/day (ECETOC TRA worker v3)	0.218
combined routes	systemic	Long-term	/	0.568

9.3.10. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	128.4 mg/m³ (ECETOC TRA worker v3)	0.175
inhalation	systemic	Short term	513.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	local	Long-term	128.4 mg/m³ (ECETOC TRA worker v3)	0.175
inhalation	local	Short term	513.9 mg/m³ (ECETOC TRA worker v3)	0.35
dermal	systemic	Long-term	13.71 mg/kg bw/day (ECETOC TRA worker v3)	0.218
combined routes	systemic	Long-term	/	0.393

9.3.11. Worker exposure: Transfer of a substance or a preparation (filling/emptying) at non-dedicated facilities (PROC8a)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	systemic	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
inhalation	local	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	local	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
dermal	systemic	Long-term	13.71 mg/kg bw/day (ECETOC TRA worker v3)	0.218
combined routes	systemic	Long-term	/	0.568

9.3.12. Worker exposure: Transfer of a substance or a mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	systemic	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Long-term	91.77 mg/m³ (ECETOC TRA worker v3)	0.125
inhalation	local	Short term	367.1 mg/m³ (ECETOC TRA worker v3)	0.25
dermal	systemic	Long-term	13.71 mg/kg bw/day (ECETOC TRA worker v3)	0.218
combined routes	systemic	Long-term	/	0.343

9.3.13. Worker exposure: Application with rollers or brushes (PROC10)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	systemic	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
inhalation	local	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	local	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
dermal	systemic	Long-term	27.43 mg/kg bw/day (ECETOC TRA worker v3)	0.435
combined routes	systemic	Long-term	/	0.785

9.3.14. Worker exposure: Application with rollers or brushes (PROC10)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	128.4 mg/m³ (ECETOC TRA worker v3)	0.175
inhalation	systemic	Short term	513.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	local	Long-term	128.4 mg/m³ (ECETOC TRA worker v3)	0.175
inhalation	local	Short term	513.9 mg/m³ (ECETOC TRA worker v3)	0.35
dermal	systemic	Long-term	27.43 mg/kg bw/day (ECETOC TRA worker v3)	0.435
combined routes	systemic	Long-term	/	0.61

9.3.15. Worker exposure: Non-industrial spray application (PROC11)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	308.3 mg/m³ (ECETOC TRA worker v3)	0.42
inhalation	systemic	Short term	mg/m³ (ECETOC TRA worker v3)	0.84
inhalation	local	Long-term	308.3 mg/m³ (ECETOC TRA worker v3)	0.42
inhalation	local	Short term	mg/m³ (ECETOC TRA worker v3)	0.84
dermal	systemic	Long-term	12.85 mg/kg bw/day (ECETOC TRA worker v3)	0.204
combined routes	systemic	Long-term	/	0.624

9.3.16. Worker exposure: Non-industrial spray application (PROC11)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	154.1 mg/m³ (ECETOC TRA worker v3)	0.21
inhalation	systemic	Short term	616.7 mg/m³ (ECETOC TRA worker v3)	0.42
inhalation	local	Long-term	154.1 mg/m³ (ECETOC TRA worker v3)	0.21
inhalation	local	Short term	616.7 mg/m³ (ECETOC TRA worker v3)	0.42
dermal	systemic	Long-term	12.85 mg/kg bw/day (ECETOC TRA worker v3)	0.204
combined routes	systemic	Long-term	/	0.414

9.3.17. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	165.1 mg/m³ (ECETOC TRA worker v3)	0.225
inhalation	systemic	Short term	660.7 mg/m³ (ECETOC TRA worker v3)	0.45
inhalation	local	Long-term	165.1 mg/m³ (ECETOC TRA worker v3)	0.225
inhalation	local	Short term	660.7 mg/m³ (ECETOC TRA worker v3)	0.45
dermal	systemic	Long-term	8.226 mg/kg bw/day (ECETOC TRA worker v3)	0.131
combined routes	systemic	Long-term	/	0.356

9.3.18. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	38.54 mg/m³ (ECETOC TRA worker v3)	0.053
inhalation	systemic	Short term	154.1 mg/m³ (ECETOC TRA worker v3)	0.105
inhalation	local	Long-term	38.54 mg/m³ (ECETOC TRA worker v3)	0.053
inhalation	local	Short term	154.1 mg/m³ (ECETOC TRA worker v3)	0.105
dermal	systemic	Long-term	8.226 mg/kg bw/day (ECETOC TRA worker v3)	0.131
combined routes	systemic	Long-term	/	0.183

9.3.19. Worker exposure: Use as laboratory reagents (PROC15)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	183.5 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	systemic	Short term	734.2 mg/m³ (ECETOC TRA worker v3)	0.5
inhalation	local	Long-term	183.5 mg/m³ (ECETOC TRA worker v3)	0.25
inhalation	local	Short term	734.2 mg/m³ (ECETOC TRA worker v3)	0.5
dermal	systemic	Long-term	0.34 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	Long-term	/	0.255

9.3.20. Worker exposure: Hand-mixing with direct contact and only PPE available (PROC19)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	330.3 mg/m³ (ECETOC TRA worker v3)	0.45
inhalation	systemic	Short term	1.32 g/m³ (ECETOC TRA worker v3)	0.9
inhalation	local	Long-term	330.3 mg/m³ (ECETOC TRA worker v3)	0.45
inhalation	local	Short term	1.32 g/m³ (ECETOC TRA worker v3)	0.9
dermal	systemic	Long-term	16.97 mg/kg bw/day (ECETOC TRA worker v3)	0.269
combined routes	systemic	Long-term	/	0.72

9.3.21. Worker exposure: Hand-mixing with direct contact and only PPE available (PROC19)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	systemic	Short term	mg/m³ (ECETOC TRA worker v3)	0.7
inhalation	local	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	local	Short term	mg/m³ (ECETOC TRA worker v3)	0.7
dermal	systemic	Long-term	5.657 mg/kg bw/day (ECETOC TRA worker v3)	0.09
combined routes	systemic	Long-term	/	0.44

9.4. GUIDANCE FOR DOWNSTREAM USERS TO ASSESS WHETHER THEY COMPLY WITH THE LIMITS SET BY THE EXPOSURE SCENARIO

Guidance to check compliance with the exposure scenario: https://echa.europa.eu/

ES 12: USE IN DETERGENT PRODUCTS (GEST4_I, GEST4_P, GEST4_C).

12.1. WIDE DISPERSIVE USE BY PROFESSIONAL WORKERS

Environment
SC 1: Wide dispersive use of non-reactive processing aid (no inclusion into the article, indoors) ERC8a

Worker
SC 2: Filling of equipment from drums and containers, specialised site PROC8b
SC 3: Automated process with (semi) closed systems; Use in closed systems PROC2
SC 4: Automated process with (semi) closed systems Drum/batch transfers, Use in closed systems PROC3
SC 5: Semi-automatic process (e.g: Semi-automatic application of floor care and maintenance products) PROC4
SC 6: Filling of equipment from drums and containers, Outdoor use PROC8a
SC 7: Immersion, dipping and pouring, Manual, Surfaces, Cleaning PROC13
SC 8: Cleaning with low-pressure washers, Roller application or brushing, No spraying PROC10
SC 9: Cleaning with high pressure washers, Spraying, Indoor use PROC11
SC 10: Cleaning with high pressure washers Spraying, Outdoor use PROC11
SC 11: Application of cleaning products in closed systems, Manual, Surfaces, Cleaning PROC10
SC 12: Ad hoc manual application via trigger sprays, partial dipping, etc., Roller application or brushing PROC10
SC 13: Application of cleaning products in closed systems, Outdoor use PROC4
SC 14: Cleaning of medical devices PROC4

12.2. CONDITIONS OF USE THAT AFFECT EXPOSURE

12.2.1 Environmental exposure control: Wide dispersive use of non-reactive processing aid (no inclusion into the article, indoors) (ERC8a)

Organizational and technical measures and conditions
A wastewater treatment plant is expected.

Conditions and measures for waste treatment (including the article of waste)
Waste treatment: Dispose of waste products or used containers according to local regulations.

12.2.2. Worker Exposure Control: Transfer of a substance or a mixture (charging/discharging) at dedicated facilities (PROC8b)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a good standard of general ventilation (from 5 to 10 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

12.2.3. Worker Exposure Control: Chemical production or refinery in closed process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a basic level of general ventilation (1 to 3 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

12.2.4. Worker Exposure Control: Chemical production or formulation in closed batch processes, with occasional controlled exposure or processes with equivalent containment conditions (PROC3)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a basic level of general ventilation (1 to 3 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

12.2.5. Worker Exposure Control: Production of chemicals with the possibility of exposure (PROC4)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a good standard of general ventilation (from 5 to 10 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

12.2.6. Worker Exposure Control: Transfer of a substance or a preparation (filling/emptying) at non-dedicated facilities (PROC8a)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Conditions and measures for personal protection, hygiene and health assessment
Wear suitable respirator.
For more information, refer to Section 8 of the SDS (safety data sheet).
Inhalation - minimum yield of 90%

Other conditions affecting worker exposure
Indoor and outdoor use: Outdoor use
Temperature: Process temperature up to 40°C is assumed

12.2.7. Worker Exposure Control: Treatment of articles by dipping and pouring (PROC13)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a good standard of general ventilation (from 5 to 10 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

12.2.8. Worker Exposure Control: Application with rollers or brushes (PROC10)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a good standard of general ventilation (from 5 to 10 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

12.2.9. Worker Exposure Control: Non-industrial spray application (PROC11)

Product features (article)
Covers concentrations up to 5 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a good standard of general ventilation (from 5 to 10 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

12.2.10. Worker Exposure Control: Non-industrial spray application (PROC11)

Product features (article)
Covers concentrations up to 1%

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Conditions and measures for personal protection, hygiene and health assessment
Wear suitable gloves tested to EN374.
If skin contamination is expected to extend to other parts of the body, these parts should also be protected with impermeable clothing equivalent to that described for the hands.
For more information, refer to Section 8 of the SDS (safety data sheet).

Other conditions affecting worker exposure
Indoor and outdoor use: Outdoor use
Temperature: Process temperature up to 40°C is assumed

12.2.11. Worker Exposure Control: Application with rollers or brushes (PROC10)

Product features (article)
Covers concentrations up to 5 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

5.2.12. Worker Exposure Control: Application with rollers or brushes (PROC10)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 80%
Provide a basic level of general ventilation (1 to 3 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

12.2.13. Worker Exposure Control: Production of chemicals with the possibility of exposure (PROC4)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Conditions and measures for personal protection, hygiene and health assessment
Wear suitable respirator.
For more information, refer to Section 8 of the SDS (safety data sheet).
Inhalation - minimum yield of 90%

Other conditions affecting worker exposure
Indoor and outdoor use: Outdoor use
Temperature: Process temperature up to 40°C is assumed

12.2.14. Worker Exposure Control: Production of chemicals with the possibility of exposure (PROC4)

Product features (article)
Covers concentrations up to 25 %

Amount used (or contained in articles), frequency and duration of use/exposure
Frequency of use: Covers use up to 8 h/day

Organizational and technical measures and conditions
Local exhaust ventilation
Inhalation - minimum yield of 80%
Provide a basic level of general ventilation (1 to 3 air changes per hour).

Other conditions affecting worker exposure
Indoor and outdoor use: Indoor use
Temperature: Process temperature up to 40°C is assumed

12.3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

12.3.1. Environmental release and exposure: Wide dispersive use of non-reactive processing aid (no inclusion into the article, indoors) (ERC8a)

Route release	Release rate	Method for estimating for release
water	0.014 kg/day	Environmental Release Category (ERC)
air	0.014 kg/day	Environmental Release Category (ERC)
Soil	0 kg/day	Environmental Release Category (ERC)

Protection target	Estimated exposure	RCR
Fresh water	0.000397 mg/l (EUSES v2.1)	< 0.01
freshwater sediments	0.00237 mg/kg dry weight (EUSES v2.1)	< 0.01
Sea water	0.0000598 mg/l (EUSES v2.1)	< 0.01
Marine sediment	0.000357 mg/kg dry weight (EUSES v2.1)	< 0.01
Sewage treatment plant	0.000811 mg/l (EUSES v2.1)	< 0.01
Farmland	0.000131 mg/kg dry weight (EUSES v2.1)	< 0.01
Prey for predators (freshwater)	0.011 mg/kg dry weight (EUSES v2.1)	< 0.01
Prey for predators (marine water)	0.00167 mg/kg dry weight (EUSES v2.1)	< 0.01
Main predator prey (marine water)	0.00158 mg/kg dry weight (EUSES v2.1)	< 0.01
Prey for Predators (Terrestrial)	0.000114 mg/kg dry weight (EUSES v2.1)	< 0.01

12.3.2. Worker exposure: Transfer of a substance or a mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	165.1 mg/m³ (ECETOC TRA worker v3)	0.225
inhalation	systemic	Short term	660.7 mg/m³ (ECETOC TRA worker v3)	0.45
inhalation	local	Long-term	165.1 mg/m³ (ECETOC TRA worker v3)	0.225
inhalation	local	Short term	660.7 mg/m³ (ECETOC TRA worker v3)	0.45
dermal	systemic	Long-term	8.226 mg/kg bw/day (ECETOC TRA worker v3)	0.131
combined routes	systemic	Long-term	/	0.356

12.3.3. Worker exposure: Chemical production or refinery in closed process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	110.1 mg/m³ (ECETOC TRA worker v3)	0.15
inhalation	local	Long-term	110.1 mg/m³ (ECETOC TRA worker v3)	0.15
inhalation	local	Short term	440.5 mg/m³ (ECETOC TRA worker v3)	0.3
inhalation	systemic	Short term	440.5 mg/m³ (ECETOC TRA worker v3)	0.3
dermal	systemic	Long-term	0.822 mg/kg bw/day (ECETOC TRA worker v3)	0.013
combined routes	systemic	Long-term	/	0.163

12.3.4. Worker exposure: Chemical production or formulation in closed batch processes, with occasional controlled exposure or processes with equivalent containment conditions (PROC3)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	220.2 mg/m³ (ECETOC TRA worker v3)	0.3
inhalation	systemic	Short term	881.0 mg/m³ (ECETOC TRA worker v3)	0.6
inhalation	local	Long-term	220.2 mg/m³ (ECETOC TRA worker v3)	0.3
inhalation	local	Short term	881.0 mg/m³ (ECETOC TRA worker v3)	0.6
dermal	systemic	Long-term	0.414 mg/kg bw/day (ECETOC TRA worker v3)	< 0.01
combined routes	systemic	Long-term	/	0.307

12.3.5. Worker exposure: Production of chemicals with the possibility of exposure (PROC4)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	165.1 mg/m³ (ECETOC TRA worker v3)	0.225
inhalation	systemic	Short term	660.7 mg/m³ (ECETOC TRA worker v3)	0.45
inhalation	local	Long-term	165.1 mg/m³ (ECETOC TRA worker v3)	0.225
inhalation	local	Short term	660.7 mg/m³ (ECETOC TRA worker v3)	0.45
dermal	systemic	Long-term	4.116 mg/kg bw/day (ECETOC TRA worker v3)	0.065
combined routes	systemic	Long-term	/	0.29

12.3.6. Worker exposure: Transfer of a substance or a preparation (filling/emptying) at non-dedicated facilities (PROC8a)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	77.09 mg/m³ (ECETOC TRA worker v3)	0.105
inhalation	systemic	Short term	308.3 mg/m³ (ECETOC TRA worker v3)	0.21
inhalation	local	Long-term	77.09 mg/m³ (ECETOC TRA worker v3)	0.105
inhalation	local	Short term	308.3 mg/m³ (ECETOC TRA worker v3)	0.21
dermal	systemic	Long-term	8.226 mg/kg bw/day (ECETOC TRA worker v3)	0.131
combined routes	systemic	Long-term	/	0.236

12.3.7. Worker exposure: Treatment of articles by dipping and pouring (PROC13)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	165.1 mg/m³ (ECETOC TRA worker v3)	0.225
inhalation	systemic	Short term	660.7 mg/m³ (ECETOC TRA worker v3)	0.45
inhalation	local	Long-term	165.1 mg/m³ (ECETOC TRA worker v3)	0.225
inhalation	local	Short term	660.7 mg/m³ (ECETOC TRA worker v3)	0.45
dermal	systemic	Long-term	8.226 mg/kg bw/day (ECETOC TRA worker v3)	0.131
combined routes	systemic	Long-term	/	0.356

12.3.8. Worker exposure: Application with rollers or brushes (PROC10)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	330.3 mg/m³ (ECETOC TRA worker v3)	0.45
inhalation	systemic	Short term	mg/m³ (ECETOC TRA worker v3)	0.9
inhalation	local	Long-term	330.3 mg/m³ (ECETOC TRA worker v3)	0.45
inhalation	local	Short term	mg/m³ (ECETOC TRA worker v3)	0.9
dermal	systemic	Long-term	16.45 mg/kg bw/day (ECETOC TRA worker v3)	0.261
combined routes	systemic	Long-term	/	0.711

12.3.9. Worker exposure: Non-industrial spray application (PROC11)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	220.2 mg/m³ (ECETOC TRA worker v3)	0.3
inhalation	systemic	Short term	881.0 mg/m³ (ECETOC TRA worker v3)	0.6
inhalation	local	Long-term	220.2 mg/m³ (ECETOC TRA worker v3)	0.3
inhalation	local	Short term	881.0 mg/m³ (ECETOC TRA worker v3)	0.6
dermal	systemic	Long-term	21.42 mg/kg bw/day (ECETOC TRA worker v3)	0.34
combined routes	systemic	Long-term	/	0.64

12.3.10. Worker exposure: Non-industrial spray application (PROC11)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	systemic	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
inhalation	local	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	local	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
dermal	systemic	Long-term	2.143 mg/kg bw/day (ECETOC TRA worker v3)	0.034
combined routes	systemic	Long-term	/	0.384

12.3.11. Worker exposure: Application with rollers or brushes (PROC10)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	systemic	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
inhalation	local	Long-term	256.9 mg/m³ (ECETOC TRA worker v3)	0.35
inhalation	local	Short term	1.03 g/m³ (ECETOC TRA worker v3)	0.7
dermal	systemic	Long-term	5.486 mg/kg bw/day (ECETOC TRA worker v3)	0.087
combined routes	systemic	Long-term	/	0.437

12.3.12. Worker exposure: Application with rollers or brushes (PROC10)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	220.2 mg/m³ (ECETOC TRA worker v3)	0.3
inhalation	systemic	Short term	881.0 mg/m³ (ECETOC TRA worker v3)	0.6
inhalation	local	Long-term	220.2 mg/m³ (ECETOC TRA worker v3)	0.3
inhalation	local	Short term	881.0 mg/m³ (ECETOC TRA worker v3)	0.6
dermal	systemic	Long-term	16.45 mg/kg bw/day (ECETOC TRA worker v3)	0.261
combined routes	systemic	Long-term	/	0.561

12.3.13. Worker exposure: Production of chemicals with the possibility of exposure (PROC4)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	38.54 mg/m³ (ECETOC TRA worker v3)	0.053
inhalation	systemic	Short term	154.1 mg/m³ (ECETOC TRA worker v3)	0.105
inhalation	local	Long-term	38.54 mg/m³ (ECETOC TRA worker v3)	0.053
inhalation	local	Short term	154.1 mg/m³ (ECETOC TRA worker v3)	0.105
dermal	systemic	Long-term	4.116 mg/kg bw/day (ECETOC TRA worker v3)	0.065
combined routes	systemic	Long-term	/	0.118

12.3.14. Worker exposure: Production of chemicals with the possibility of exposure (PROC4)

Exposure routes	Health effect	Exposure indicator	Estimated exposure	RCR
inhalation	systemic	Long-term	110.1 mg/m³ (ECETOC TRA worker v3)	0.15
inhalation	systemic	Short term	440.5 mg/m³ (ECETOC TRA worker v3)	0.3
inhalation	local	Long-term	110.1 mg/m³ (ECETOC TRA worker v3)	0.15
inhalation	local	Short term	440.5 mg/m³ (ECETOC TRA worker v3)	0.3
dermal	systemic	Long-term	4.116 mg/kg bw/day (ECETOC TRA worker v3)	0.065
combined routes	systemic	Long-term	/	0.215

12.4. GUIDANCE FOR DOWNSTREAM USERS TO ASSESS WHETHER THEY COMPLY WITH THE LIMITS SET BY THE EXPOSURE SCENARIO

Guidance to check compliance with the exposure scenario: https://echa.europa.eu/

4,4'-methylenediphenyl diisocyanate

Identification of the exposure scenario
Product name: 4,4'-methylenediphenyl diisocyanate
CAS number: 101-68-8
Review date: 27/05/2021 rev. 13.1

PROFESSIONAL USE - USE IN COATINGS

1. TITLE SECTION

Structured short title
Wide dispersive use by professional workers; Use in coatings.

Worker
SC1 Use in coatings [MDI]: PROC4
SC2 Use in coatings [MDI]: PROC5
SC3 Use in coatings [MDI]: PROC8a
SC4 Use in coatings [MDI]: PROC8b
SC5 Use in coatings [MDI]: PROC10
SC6 Use in coatings [MDI]: PROC11
SC7 Use in coatings [MDI]: PROC13

2. CONDITIONS OF USE AFFECTING EXPOSURE

2.1. Control of worker exposure: Use in batch and other processes (synthesis), where exposure opportunities occur (PROC4) [MDI]

Product features (article)
Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)
General exposures: 8 hours/day
Frequency of use: 5 days/week

Organizational and technical measures and conditions
These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.

With local extract system (LEV):
- Localized aspiration is required.
- Provide a ventilation extract for points where emissions occur.
- Provide extract ventilation at material transfer points and other openings.

Conditions and measures for personal protection, hygiene and health assessment

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:

- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Use adequate eye protection.
- Use adequate eye protection.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:

- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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.

Other conditions affecting worker exposure

Exposed skin area: 480 cm² (palm both hands)
Indoor and outdoor use: Indoor use
Temperature: 50°C

2.2. Control of worker exposure: Mixture or mixture by batch processes (batch process) for the formulation of preparations and articles (contact in different phases and/or important contact) (PROC5) [MDI]

Product features (article)

Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)

General exposures: 1 hour/day
Frequency of use: 5 days/week

Organizational and technical measures and conditions

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:

- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:

- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.

Indoor use with local exhaust system (LEV):
- Ensure that the control measures can be inspected and undergo maintenance.
- Localized aspiration is required.
- Provide a ventilation extract for points where emissions occur.
- Provide extract ventilation at material transfer points and other openings.

Indoor use without local ventilation system or outdoor use:
Ensure that the control measures can be inspected and undergo maintenance.

Conditions and measures for personal protection, hygiene and health assessment

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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.
- Indoor use without local ventilation system or outdoor use:
- Wear a respirator in accordance with EN140.

Other conditions affecting worker exposure

Exposed skin area: 480 cm² (palm both hands)
Indoor and outdoor use: Indoor/Outdoor use
Temperature: 23°C

2.3. Control of worker exposure: Transfer of a substance or a preparation (filling/ emptying) from/to vessels/large containers, in non-dedicated facilities (PROC8a) [MDI]

Product features (article)

Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)

General exposures: 1 hour/day
Remarks: Daily or more rarely. Short term
Frequency of use: 5 days/week

Organizational and technical measures and conditions

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.

Conditions and measures for personal protection, hygiene and health assessment

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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.

Other conditions affecting worker exposure

Exposed skin area: 960 cm² (both hands)
Indoor and outdoor use: Indoor use
Temperature: 23°C

2.4. Control of worker exposure: Transfer of a substance or a preparation (filling/ emptying) from/to vessels/large containers, in non-dedicated facilities (PROC8b) [MDI]

Product features (article)

Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)

General exposures: 1 hour/day
Remarks: Daily or more rarely. Short term
Frequency of use: 5 days/week

Organizational and technical measures and conditions

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.
- Handle substance within a closed system.

Conditions and measures for personal protection, hygiene and health assessment

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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.

Other conditions affecting worker exposure

Exposed skin area: 960 cm² (both hands)
Indoor and outdoor use: Indoor use
Temperature: 23°C

2.5. Worker Exposure Control: Roller or Brush Application (PROC10) [MDI]

Product features (article)

Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)

General exposures: 8 hours/day
Frequency of use: 5 days/week

Organizational and technical measures and conditions

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.

Conditions and measures for personal protection, hygiene and health assessment

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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.

Other conditions affecting worker exposure

Exposed skin area: 960 cm² (both hands)
Indoor and outdoor use: Indoor use
Temperature: 23°C

2.6. Control of worker exposure: Non-industrial spraying (PROC11) [MDI]

Product features (article)

Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)

General exposures: 6 hours/day
Remarks: 1,-,5
Frequency of use: 5 days/week

Organizational and technical measures and conditions

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.

Indoor use 1:
- Ensure that the control measures can be inspected and undergo maintenance.
- Localized aspiration is required.
- Handle substance within a predominantly closed system provided with extract ventilation.
- Provide a ventilation extract for points where emissions occur.
- Provide extract ventilation at material transfer points and other openings.

Indoor use 2:
- Access to the work area is restricted to authorised personnel only.
- Ensure that the control measures can be inspected and undergo maintenance.
- Localized aspiration is required.
- Make sure a spray booth is used.

Indoor use 3:
- Access to the work area is restricted to authorised personnel only.
- Ensure that the control measures can be inspected and undergo maintenance.
- Open doors and windows.
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Ensure good ventilation.

Indoor use 4:
- Access to the work area is restricted to authorised personnel only.
- Ensure that the control measures can be inspected and undergo maintenance.
- Localized aspiration is required.
- Provide a ventilation extract for points where emissions occur.

Outdoor use 5:
- Access to the work area is restricted to authorised personnel only.
- Ensure that the control measures can be inspected and undergo maintenance.
- Make sure the operation is performed outdoors.
- Stay upwind/keep distance from source.

Conditions and measures for personal protection, hygiene and health assessment

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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 information
- Regardless of the risk reduction measures described here, a respirator is generally recommended for spray applications.
Indoor use 2:
- Wear a full face respirator in accordance with EN136.
Indoor use 3:
- Wear a full face respirator in accordance with EN136.
Indoor use 4:
- Wear a full face respirator in accordance with EN136.
Outdoor use 5:
- Wear a full face respirator in accordance with EN136.

Other conditions affecting worker exposure

Exposed skin area: 1500 cm² (both hands and forearms)
Indoor and outdoor use: Indoor/Outdoor use
Temperature: 35°C
Remarks: 1,-,5

2.7 Controlling Worker Exposure: Treatment of Articles by dipping and pouring (PROC13) [MDI]

Product features (article)

Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)

General exposures: 8 hours/day
Frequency of use: 5 days/week

Organizational and technical measures and conditions

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.

Conditions and measures for personal protection, hygiene and health assessment

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:

- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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.

Other conditions affecting worker exposure

Exposed skin area: 480 cm² (palm both hands)
Indoor and outdoor use: Indoor use
Temperature: 23°C

3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

3.1. Worker exposure: Use in batch and other processes (synthesis), where exposure opportunities occur (PROC4) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.0006 mg/m³ (EasyTRA, v4.1)	0.012	General ventilation	30%
			Respiratory protection	90% efficiency
			LEV	90% efficiency
Local effects, by inhalation, local	0.0006 mg/m³ (EasyTRA, v4.1)	0,012	General ventilation	30%
			Respiratory protection	90% efficiency Without local ventilation
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

3.2. Worker exposure: Mixture or blending by batch processes (discontinuous process) for the formulation of preparations and articles (contact in different phases and/or important contact) (PROC5)

[MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.00011 mg/m³ (EasyTRA, v4.1)	0.0022	Indoor use	
			General ventilation	30%
			LEV	90% efficiency
			Respiratory protection	90% efficiency
Local effects, by inhalation, local	0.00011 mg/m³ (EasyTRA, v4.1)	0.0022	Outdoor use	
			Outdoor use	30%
			Respiratory protection	90% efficiency
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

3.3. Worker exposure: Transfer of a substance or a preparation (filling/ emptying) from/ to vessels/ large containers, in non-dedicated facilities (PROC8a) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.0036 mg/m³ (EasyTRA, v4.1)	0.072	General ventilation	30%
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

3.4. Worker exposure: Transfer of a substance or a preparation (filling/ emptying) from/ to vessels/ large containers, in dedicated facilities (PROC8b) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.00364 mg/m³ (EasyTRA, v4.1)	0.0728	General ventilation	30%
			Closed system	99% efficiency
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

3.5. Worker exposure: Roller or brush application (PROC10) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.017 mg/m³ (EasyTRA, v4.1)	0.340	General ventilation	30%
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1). * Qualitative approach used to establish safe use.

3.6. Worker exposure: Non-industrial misting (PROC11) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.012 mg/m³ (EasyTRA, v4.1)	0.240	Indoor use	1
			General ventilation	30%
			LEV	99% efficiency
Local effects, by inhalation, local	0.003 mg/m³ (EasyTRA, v4.1)	0.060	Indoor use	2
			General ventilation	30%
			Paint booth	90% reduction
			Respiratory protection	97.5% efficiency
Local effects, by inhalation, local	0.022 mg/m³ (EasyTRA, v4.1)	0.440	Indoor use	3
			General ventilation	30%
			Respiratory protection	97.5% efficiency
Local effects, by inhalation, local	0.003 mg/m³ (EasyTRA, v4.1)	0.060	Indoor use	4
			General ventilation	30%
			LEV	90% efficiency
			Respiratory protection	97.5% efficiency
Local effects, by inhalation, local	0.0022 mg/m³ (EasyTRA, v4.1)	0.440	Outdoor use	5
			Outdoors:	30% reduction
			Respiratory protection	97.5% efficiency
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

3.7. Worker exposure: Treatment of articles by dipping and pouring (PROC13) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.017 mg/m³ (EasyTRA, v4.1)	0.340	General ventilation	30%
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

4. GUIDANCE FOR DOWNSTREAM USERS TO ASSESS WHETHER THEY COMPLY WITH THE LIMITS SET BY THE EXPOSURE SCENARIO MDI

The risk management measures described in this exposure scenario apply to the specified substance in the concentration described by the scenario. The concentration of the substance in the product may differ. Downstream users should therefore check whether a scaling of the risk management measures is appropriate.
Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Further information on the risk management measures and operational conditions for this type of exposure is available at www.ISOPA.org.

PROFESSIONAL USE - ADHESIVES, SEALANTS

1. TITLE SECTION

Structured short title

Wide dispersive use by professional workers; Adhesives, sealants

Worker

SC1 Adhesives, Sealants [MDI]: PROC4
SC2 Adhesives, Sealants [MDI]: PROC5
SC3 Adhesives, Sealants [MDI]: PROC8a
SC4 Adhesives, Sealants [MDI]: PROC8b
SC5 Adhesives, Sealants [MDI]: PROC10
SC6 Adhesives, Sealants [MDI]: PROC11
SC7 Adhesives, Sealants [MDI]: PROC13

2. CONDITIONS OF USE AFFECTING EXPOSURE

2.1. Control of worker exposure: Use in batch and other processes (synthesis), where exposure opportunities occur (PROC4) [MDI]

Product features (article)

Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)

General exposures: 8 hours/day
Frequency of use: 5 days/week

Organizational and technical measures and conditions

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:

- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:

- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.

With local extract system (LEV):

- Localized aspiration is required.
- Provide a ventilation extract for points where emissions occur.
- Provide extract ventilation at material transfer points and other openings.

Conditions and measures for personal protection, hygiene and health assessment

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:

- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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.

Other conditions affecting worker exposure

Exposed skin area: 480 cm² (palm both hands)
Indoor and outdoor use: Indoor use
Temperature: 50°C

2.2. Control of worker exposure: Mixture or mixture by batch processes (batch process) for the formulation of preparations and articles (contact in different phases and/or important contact) (PROC5) [MDI]

Product features (article)

Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)

General exposures: 1 hour/day
Frequency of use: 5 days/week

Organizational and technical measures and conditions

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:

- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:

- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.

Indoor use without local ventilation system or outdoor use:
- Ensure that the control measures can be inspected and undergo maintenance.

Indoor use with local exhaust system (LEV):
- Ensure that the control measures can be inspected and undergo maintenance.
- Localized aspiration is required.
- Provide a ventilation extract for points where emissions occur.
- Provide extract ventilation at material transfer points and other openings.

Conditions and measures for personal protection, hygiene and health assessment

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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.

Indoor use without local ventilation system or outdoor use:
- Wear a respirator in accordance with EN140.

Other conditions affecting worker exposure

Exposed skin area: 480 cm² (palm both hands)
Indoor and outdoor use: Indoor/Outdoor use
Temperature: 23°C

2.3. Control of worker exposure: Transfer of a substance or a preparation (filling/emptying) from/to vessels/large containers, in non-dedicated facilities (PROC8a) [MDI]

Product features (article)

Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)

General exposures: 1 hour/day
Remarks: Daily or more rarely. Short term
Frequency of use: 5 days/week

Organizational and technical measures and conditions

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.

Conditions and measures for personal protection, hygiene and health assessment

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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.

Other conditions affecting worker exposure

Exposed skin area: 960 cm² (both hands)
Indoor and outdoor use: Indoor use
Temperature: 23°C

2.4. Control of worker exposure: Transfer of a substance or a preparation (filling/emptying) from/to vessels/large containers, in non-dedicated facilities (PROC8b) [MDI]

Product features (article)

Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)

General exposures: 1 hour/day
Remarks: Daily or more rarely. Short term
Frequency of use: 5 days/week

Organizational and technical measures and conditions

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.
- Handle substance within a closed system.

Conditions and measures for personal protection, hygiene and health assessment
These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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.

Other conditions affecting worker exposure
Exposed skin area: 960 cm² (both hands)
Indoor and outdoor use: Indoor use
Temperature: 23°C

2.5. Worker Exposure Control: Roller or Brush Application (PROC10) [MDI]

Product features (article)
Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)
General exposures: 8 hours/day
Frequency of use: 5 days/week

Organizational and technical measures and conditions
These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.

Conditions and measures for personal protection, hygiene and health assessment

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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.

Other conditions affecting worker exposure

Exposed skin area: 960 cm² (both hands)
Indoor and outdoor use: Indoor use
Temperature: 23°C

2.6. Control of worker exposure: Non-industrial spraying (PROC11) [MDI]

Product features (article)

Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)

General exposures: 6 hours/day
Remarks: 1,-,5
Frequency of use: 5 days/week

Organizational and technical measures and conditions

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.

Indoor use 1:
- Ensure that the control measures can be inspected and undergo maintenance.
- Localized aspiration is required.
- Handle substance within a predominantly closed system provided with extract ventilation.
- Provide a ventilation extract for points where emissions occur.
- Provide extract ventilation at material transfer points and other openings.

Indoor use 2:
- Access to the work area is restricted to authorised personnel only.
- Ensure that the control measures can be inspected and undergo maintenance.
- Localized aspiration is required.
- Make sure a spray booth is used.

Indoor use 3:
- Access to the work area is restricted to authorised personnel only.
- Ensure that the control measures can be inspected and undergo maintenance.
- Open doors and windows.
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Ensure good ventilation.

Indoor use 4:
- Access to the work area is restricted to authorised personnel only.
- Ensure that the control measures can be inspected and undergo maintenance.
- Localized aspiration is required.
- Provide a ventilation extract for points where emissions occur.

Outdoor use 5:
- Access to the work area is restricted to authorised personnel only.
- Ensure that the control measures can be inspected and undergo maintenance.
- Make sure the operation is performed outdoors.
- Stay upwind/keep distance from source.

Conditions and measures for personal protection, hygiene and health assessment

These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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 information
- Regardless of the risk reduction measures described here, a respirator is generally recommended for spray applications.
Indoor use 2:
- Wear a full face respirator in accordance with EN136.
Indoor use 3:
- Wear a full face respirator in accordance with EN136.
Indoor use 4:
- Wear a full face respirator in accordance with EN136.
Outdoor use 5:
- Wear a full face respirator in accordance with EN136.

Other conditions affecting worker exposure
Exposed skin area: 1500 cm² (both hands and forearms)
Indoor and outdoor use: Indoor/Outdoor use
Temperature: 35°C
Remarks: 1,-,5

2.7. Controlling Worker Exposure: Treatment of Articles by dipping and pouring (PROC13) [MDI]

Product features (article)
Concentration of substance in mixture/article: ≤ 60%
Molar mass: 250 g/mol
Vapour pressure: 0.001 pa at 20°C
Physical form of the product Low volatile liquid

Amounts used, frequency and duration of use (or useful life)
General exposures: 8 hours/day
Frequency of use: 5 days/week

Organizational and technical measures and conditions
These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:
- Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- Handle substance within a predominantly closed system provided with extract ventilation.
- Handle in a fume hood or under extract ventilation.
- Clean up spills immediately.
- Ensure personnel are informed and trained on the nature of exposure and the basic actions to be taken to minimise exposure.
- Ensure that the control measures can be inspected and undergo maintenance.

Conditions and measures for personal protection, hygiene and health assessment
These measures apply to all subsystems for products at temperatures below 40°C for pure MDI and below 45°C for other MDI-based substances or without spray application:
- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.

These measures apply to all subsystems for products at temperatures above 40°C for pure MDI and above 45°C for other MDI-based substances or with spray application and with aprotic polar solvents below 40°C:

- Do not inhale vapours/aerosols.
- Make sure that direct skin contact is avoided.
- Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
- Wash off any skin contamination immediately.
- Use adequate eye protection.
- Wear appropriate coveralls to avoid skin exposure.
- The use of latex gloves is not tolerated.
- Wear a full face respirator in accordance with EN136.
- 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.

Other conditions affecting worker exposure

Exposed skin area: 480 cm² (palm both hands)
Indoor and outdoor use: Indoor use
Temperature: 23°C

3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

3.1. Worker exposure: Use in batch and other processes (synthesis), where exposure opportunities occur (PROC4) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.0006 mg/m³ (EasyTRA, v4.1)	0.012	General ventilation	30%
			LEV	90% efficiency
			Respiratory protection	90% efficiency
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

3.2. Worker exposure: Mixture or blending by batch processes (discontinuous process) for the formulation of preparations and articles (contact in different phases and/or important contact) (PROC5) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.00011 mg/m³ (EasyTRA, v4.1)	0.0022	Indoor use	
			General ventilation	30%
			LEV	90% efficiency
			Respiratory protection	90% efficiency
Local effects, by inhalation, local	0.00011 mg/m³ (EasyTRA, v4.1)	0.0022	Outdoor use	
			Outdoor use	30%
			Respiratory protection	90% efficiency
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

3.3. Worker exposure: Transfer of a substance or a preparation (filling/ emptying) from/ to vessels/ large containers, in non-dedicated facilities (PROC8a) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.0036 mg/m³ (EasyTRA, v4.1)	0.072	General ventilation	30%
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

3.4. Worker exposure: Transfer of a substance or a preparation (filling/ emptying) from/ to vessels/ large containers, in dedicated facilities (PROC8b) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.00364 mg/m³ (EasyTRA, v4.1)	0.0728	General ventilation	30%
			Closed system	99% efficiency
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

3.5. Worker exposure: Roller or brush application (PROC10) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.017 mg/m³ (EasyTRA, v4.1)	0.340	General ventilation	30%
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

3.6. Worker exposure: Non-industrial misting (PROC11) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.012 mg/m³ (EasyTRA, v4.1)	0.240	Indoor use	1
			General ventilation	30%
			LEV	99% efficiency
Local effects, by inhalation, local	0.003 mg/m³ (EasyTRA, v4.1)	0.060	Indoor use	2
			General ventilation	30%
			Respiratory protection	97.5% efficiency
Local effects, by inhalation, local	0.022 mg/m³ (EasyTRA, v4.1)	0.440	Indoor use	3
			General ventilation	30%
			Respiratory protection	97.5% efficiency
Local effects, by inhalation, local	0.003 mg/m³ (EasyTRA, v4.1)	0.060	Indoor use	4
			General ventilation	30%
			LEV	90% efficiency
			Respiratory protection	97.5% efficiency
Local effects, by inhalation, local	0.022 mg/m³ (EasyTRA, v4.1)	0.440	Outdoor use	5
			Outdoors:	30% reduction
			Respiratory protection	97.5% efficiency
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

3.7. Worker exposure: Treatment of articles by dipping and pouring (PROC13) [MDI]

Exposure routes	Exposure level	RCR	Observations	
Local effects, by inhalation, local	0.017 mg/m³ (EasyTRA, v4.1)	0.340	General ventilation	30%
Dermal exposure	* (Qualitative evaluation)	< 1	Gloves	90% protection

Learn more about exposure estimates

Based on the risk management measures adopted, the risk to humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to establish safe use.

4. GUIDANCE FOR DOWNSTREAM USERS TO ASSESS WHETHER THEY COMPLY WITH THE LIMITS SET BY THE EXPOSURE SCENARIO MDI

The risk management measures described in this exposure scenario apply to the specified substance in the concentration described by the scenario. The concentration of the substance in the product may differ. Downstream users should therefore check whether a scaling of the risk management measures is appropriate.
Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Further information on the risk management measures and operational conditions for this type of exposure is available at www.ISOPA.org.