PRIMER ADW

Varnostni list z dne 12/06/2026 revizija 2

ODDELEK 1: Identifikacija snovi/zmesi in družbe/podjetja

1.1 Identifikator izdelka

Identifikacija pripravka:

Komercialno ime: PRIMER ADW

Komercialna koda: 582K

UFI: WYK1-H08D-G008-N88Y

1.2 Pomembne identificirane uporabe snovi ali zmesi in odsvetovane uporabe

Priporočena uporaba: Utrjevalna in izolacijska smola za cementne estrihe; Samo za profesionalno uporabo

Odsvetovane uporabe: Ni namenjeno za potrošniško uporabo

1.3 Podrobnosti o dobavitelju varnostnega lista

Dobavitelj FASSA Srl

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

Tel. +39 0422 7222

Fax +39 0422 887509

Odgovorni: laboratorio.spresiano@fassabortolo.it

1.4 Telefonska številka za nujne primere

112 - Center za obveščanje (na voljo 24 ur)

ODDELEK 2: Določitev nevarnosti



2.1 Razvrstitev snovi ali zmesi

Uredba (ES) št. 1272/2008 (CLP)

Flam. Liq. 2	Lahko vnetljiva tekočina in hlapi.
Acute Tox. 4	Zdravju škodljivo pri vdihavanju.
Skin Irrit. 2	Povzroča draženje kože.
Eye Irrit. 2	Povzroča hudo draženje oči.
Resp. Sens. 1	Lahko povzroči simptome alergije ali astme ali težave z dihanjem pri vdihavanju.
Skin Sens. 1	Lahko povzroči alergijski odziv kože.
Carc. 2	Sum povzročitve raka.
STOT SE 3	Lahko povzroči draženje dihalnih poti.
STOT SE 3	Lahko povzroči zaspanost ali omotico.
STOT RE 2	Lahko škoduje organom pri dolgotrajni ali ponavljajoči se izpostavljenosti.

Nevarnosti fizikalno-kemijskih lastnosti za zdravje ljudi in za okolje:

Ni drugih tveganj

2.2 Elementi etikete

Uredba (ES) št. 1272/2008 (CLP)

Piktogrami za nevarnost in Opozorilna beseda



Nevarno

Stavki o nevarnosti

H225	Lahko vnetljiva tekočina in hlapi.
H315	Povzroča draženje kože.
H317	Lahko povzroči alergijski odziv kože.
H319	Povzroča hudo draženje oči.
H332	Zdravju škodljivo pri vdihavanju.

H334	Lahko povzroči simptome alergije ali astme ali težave z dihanjem pri vdihavanju.
H335	Lahko povzroči draženje dihalnih poti.
H336	Lahko povzroči zaspanost ali omotico.
H351	Sum povzročitve raka.
H373	Lahko škoduje organom pri dolgotrajni ali ponavljajoči se izpostavljenosti.

Previdnostni stavki

P210	Hraniti ločeno od vročine, vročih površin, isker, odprtega ognja in drugih virov vžiga. Kajenje prepovedano.
P261	Ne vdihavati dima/plina/meglice/hlapov/razpršila.
P280	Nadenite si zaščitne rokavice/obleke ter zaščitite oči/obraz.
P304+P340	PRI VDIHAVANJU: Prenesti osebo na svež zrak in jo pustiti v udobnem položaju, ki olajša dihanje.
P342+P311	Pri respiratornih simptomih: Pokličite CENTER ZA ZASTRUPITVE/zdravnika.
P370+P378	Ob požaru: gasite z gasilnim aparatom na CO2.

Posebne oznake:

EUH204 Vsebuje izocianate. Lahko povzroči alergijski odziv.

Vsebuje:

etil acetat

4,4'-metilendifenil diizocianat

izocianova kislina, polimetilenpolifenilen ester, polimer z .alfa.-hidro.omega.-hidroksipoli[oksi(metil-1,2-etandiil)]

Reakcijska zmes 4,4'-metilendifenil diizocianat in o-(p-izocianatobenzil)fenil izocianat

izocianova kislina, polimetilenpolifenilen ester

Posebne določbe v skladu s Prilogo XVII uredbe REACH in poznejše spremembe:

Po 24. avgustu 2023 se pred industrijsko ali poklicno uporabo zahteva ustrezno usposabljanje.

2.3 Druge nevarnosti

Ni snovi PBT, vPvB ali endokrinih motilcev v koncentraciji > = 0,1%.

Ni drugih tveganj

ODDELEK 3: Sestava/podatki o sestavinah

3.1 Snovi

ni znano

3.2 Zmesi

Identifikacija pripravka: PRIMER ADW

Nevarne sestavine, skladno z Uredbo CLP in njeno razvrstitvijo:

Količina	Ime	Ident. št.	Razvrstitev	Registracijska številka:
≥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 %	izocianova kislina, polimetilenpolifenilen ester, polimer z .alfa.-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 Ocena akutne strupenosti: ATE - Vdihavanje (Prahom/meglice): 1.5mg/l ATE - Vdihavanje (Hlapi): 11mg/l	
≥10 - <20 %	izocianova kislina, 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 Posebne mejne 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 Ocena akutne strupenosti: ATE - Vdihavanje (Prahom/meglice): 1.5mg/l	
≥3 - <5 %	4,4'-metilendifenil diizocianat	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 Posebne mejne 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 Ocena akutne strupenosti: ATE - Vdihavanje (Prahom/meglice): 1.5mg/l	01-2119457014-47-xxxx
≥1 - <3 %	Reakcijska zmes 4,4'-metilendifenil diizocianat in o-(p-izocianatobenzil)fenil izocianat	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 Ocena akutne strupenosti: ATE - Vdihavanje (Hlapi): 11mg/l	01-2119457015-45-xxxx

ODDELEK 4: Ukrepi za prvo pomoč

4.1 Opis ukrepov za prvo pomoč

V primeru stika s kožo:

Kontaminirana oblačila takoj slecite in jih na varen način odstranite.

V primeru stika s proizvodom in tudi v primeru suma morebitnega stika, dele telesa takoj umijte z veliko količino tekoče vode in milom.

Umijte celotno telo (tuširanje ali kopel).

V primeru stika z očmi:

V primeru stika z očmi dovolj dolgo in z odprtimi očesnimi vekami izpirajte z obilo vode, nato poiščite pomoč zdravnika oftalmologa.

Poškodovano oko zaščitite.

V primeru zaužitja:

Po zaužitju ne izzivati bruhanja, takoj poiskati zdravniško pomoč in pokazati varnostni list in nalepko.

V primeru vdihavanja:

Prizadeto osebo umaknite na svež zrak in pustite počivati na toplem.

V primeru neenakomernega ali odsotnosti dihanja izvajajte umetno dihanje.

Če pride do zaužitja, takoj poiskati zdravniško pomoč in pokazati embalažo ali etiketo.

4.2 Najpomembnejši simptomi in učinki, akutni in zapozneli

Simptomi in ucinki so taki, kot je pricakovano glede na nevarnosti, kar je prikazano v 2. razdelku.

4.3 Navedba kakršne koli takojšnje medicinske oskrbe in posebnega zdravljenja

V primeru nesreče ali slabega počutja takoj poiščite zdravniško pomoč (če je mogoče, pokažite navodila za uporabo ali varnostni list).

ODDELEK 5: Protipožarni ukrepi

5.1 Sredstva za gašenje

Ustrezna sredstva za gašenje:

Ob požaru: gasite z gasilnim aparatom na CO2.

CO2, gasilni aparat na prah, pena, pršenje z vodo.

Sredstva za gašenje, ki se jih iz varnostnih razlogov ne sme uporabljati:

Vodni curki

5.2 Posebne nevarnosti v zvezi s snovjo ali zmesjo

Pri gorenju nastajajo težki dimni plini.

Ne vdihavati pline, ki nastanejo pri eksploziji in/ali gorenju (ogljikov monoksid in ogljikov dioksid, dušikovi oksidi).

5.3 Nasvet za gasilce

Uporabiti ustrezne dihalne naprave.

Ločeno zberite kontaminirano vodo, uporabljeno za gašenje požara. Ne je izpustiti v kanalizacijo.

Če je to varno izvedljivo, nepoškodovane vsebnike umaknite iz neposredno ogroženega območja.

ODDELEK 6: Ukrepi o nenamernih izpustih

6.1 Osebni varnostni ukrepi, zaščitna oprema in postopki v sili

Za neizučeno osebje:

Nosite osebno varovalno opremo.

Odstranite vse vire vžiga.

V primeru izpostavljenosti hlapom/prahu/aerosolom nosite dihalne aparate.

Omogočite primerno zračenje.

Uporabite ustrezno zaščito dihal.

Glejte v oddelku 7 in 8 navedene zaščitne ukrepe.

Za reševalce:

Nosite osebno varovalno opremo.

6.2 Okoljevarstveni ukrepi

Preprečite vstop v tla/podtalnico. Preprečite razlitje v površinske vode ali v kanalizacijo.

V primeru puščanja plina ali razlitja v vodne tokove, tla ali kanalizacijo obvestite pristojne organe.

6.3 Metode in materiali za zadrževanje in čiščenje

Za zbiranje primeren material: inerten vpojni materiali (npr. pesek, vermikulit).

Po pobiranju z vodo izperite območje in prizadete materiale.

Kontaminirano vodo za pranje shranite in odstranite.

6.4 Sklicevanje na druge oddelke

Glejte tudi naslova 8 in 13

ODDELEK 7: Ravnanje in skladiščenje

7.1 Varnostni ukrepi za varno ravnanje

Preprečite stik s kožo in očmi, vdihavanje hlapov in megle.

Uporabite lokaliziran sistem prezračevanja.

Prazne vsebnike ne uporabite dokler niso očiščeni.

Pred postopki prenosa se prepričajte, da v vsebnikih ni ostankov nezdružljivih materialov.

Nasveti o splošni higieni dela:

Kontaminirana oblačila se mora pred vstopom v jedilnico zamenjati.

Med delom ne jejte in ne pijte.

Glejte tudi oddelek 8 o priporočeni varovalni opremi.

7.2 Pogoji za varno skladiščenje, vključno z nezdružljivostjo

Posode hranite tesno zaprte na hladnem in dobro prezračevanem mestu proč od virov toplote.

Hranite daleč od prostih plamenov, isker in virov toplote. Izogibajte se neposredni izpostavitvi soncu.

Hranite stran od hrane, pijač in krme.

Inkompaktibilne snovi:

Glejte točko 10.5

Navodila za prostore:

Hladni in primerno zračeni.

7.3 Posebne končne uporabe

Priporočila

Glejte točko 1.2

Specifične rešitve za industrijski sektor

Nobena posebna uporaba

ODDELEK 8: Nadzor izpostavljenosti/osebna zaščita

8.1 Parametri nadzora

Mejne vrednosti za poklicno izpostavljenost

etil acetat

CAS: 141-78-6	Tip OPZ	ACGIH		Dolgotrajna 400 ppm Opombe: URT and eye irr
	Tip OPZ	EU		Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
	Tip OPZ	MAK	Avstrija	Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
	Tip OPZ	MAK	Nemčija	Dolgotrajna 750 mg/m3 - 200 ppm; Kratkotrajna 1500 mg/m3 - 400 ppm
	Tip OPZ	VLEP	Belgija	Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
	Tip OPZ	VLEP	Francija	Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
	Tip OPZ	VLEP	Italija	Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
	Tip OPZ	VLEP	Romunija	Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 400 mg/m3 - 1468 ppm
	Tip OPZ	TLV	Bolgarija	Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
	Tip OPZ	TLV	Češka	Dolgotrajna 700 mg/m3 - 191.1 ppm; Kratkotrajna 900 mg/m3 - 245.7 ppm
	Tip OPZ	VLA	Španija	Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 1460 mg/m3 - 400 ppm
	Tip OPZ	ÁK	Madžarska	Dolgotrajna 734 mg/m3; Kratkotrajna 1468 mg/m3
	Tip OPZ	MAC	Nizozemska	Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
	Tip OPZ	VLE	Portugalska	Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
	Tip OPZ	SUVA	Švicar	Dolgotrajna 730 mg/m3 - 200 ppm; Kratkotrajna 1470 mg/m3 - 400 ppm
	Tip OPZ	WEL	U.K.	Dolgotrajna 730 mg/m3 - 200 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
	Tip OPZ	GVI	Hrvaška	Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
	Tip OPZ	AGW	Nemčija	Dolgotrajna 730 mg/m3 - 200 ppm; Kratkotrajna 1460 mg/m3 - 400 ppm
	Tip OPZ	NDS	Poljska	Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
	Tip OPZ	MV	Slovenija	Dolgotrajna 734 mg/m3 - 200 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
	Tip OPZ	IPRV	Litva	Dolgotrajna 500 mg/m3 - 150 ppm; Kratkotrajna 1100 mg/m3 - 300 ppm
	Tip OPZ	RV	Latvija	Dolgotrajna 200 mg/m3 - 54 ppm; Kratkotrajna 1468 mg/m3 - 400 ppm
izocianova kislina, polimetilenpolifenilen ester				
CAS: 9016-87-9	Tip OPZ	MAK	Nemčija	Dolgotrajna 0.05 mg/m3; Kratkotrajna 0.05 mg/m3 Opombe: Inhalable fraction , Skin Kratkotrajna 0.1 mg/m3 Opombe: Inhalable fraction , Skin, Ceiling
	Tip OPZ	AGW	Nemčija	Dolgotrajna 0.05 mg/m3; Kratkotrajna 0.05 mg/m3 Opombe: Inhalable fraction , Skin Kratkotrajna 0.1 mg/m3 Opombe: Inhalable fraction , Skin, Ceiling
4,4'-metilendifenil diizocianat				
CAS: 101-68-8	Tip OPZ	ACGIH		Dolgotrajna 0.005 ppm Opombe: Resp sens
	Tip OPZ	EU		Dolgotrajna 0.006 mg/m3; Kratkotrajna 0.012 mg/m3 Opombe: Skin; Dermal and respiratory sensitisation
	Tip OPZ	MAK	Avstrija	Dolgotrajna 0.05 mg/m3 - 0.005 ppm; Kratkotrajna 0.1 mg/m3 - 0.001 ppm
	Tip OPZ	MAK	Nemčija	Dolgotrajna 0.05 mg/m3; Kratkotrajna 0.05 mg/m3 Opombe: Inhalable fraction and vapour, Skin Kratkotrajna 0.1 mg/m3 Opombe: Inhalable fraction and vapour, Skin
	Tip OPZ	VLEP	Belgija	Dolgotrajna 0.052 mg/m3 - 0.005 ppm
	Tip OPZ	VLEP	Francija	Dolgotrajna 0.1 mg/m3 - 0.01 ppm; Kratkotrajna 0.2 mg/m3 - 0.02 ppm
	Tip OPZ	VLEP	Romunija	Kratkotrajna 0.15 mg/m3
	Tip OPZ	TLV	Češka	Dolgotrajna 0.05 mg/m3; Kratkotrajna 0.1 mg/m3
	Tip OPZ	VLA	Španija	Dolgotrajna 0.005 mg/m3 - 0.052 ppm
	Tip OPZ	ÁK	Madžarska	Dolgotrajna 0.05 mg/m3; Kratkotrajna 0.05 mg/m3
	Tip OPZ	AGW	Nemčija	Dolgotrajna 0.05 mg/m3; Kratkotrajna 0.05 mg/m3 Opombe: Inhalable fraction and vapour, Skin Kratkotrajna 0.1 mg/m3 Opombe: Inhalable fraction and vapour, Skin
	Tip OPZ	NDS	Poljska	Dolgotrajna 0.03 mg/m3; Kratkotrajna 0.09 mg/m3

Tip OPZ	MV	Slovenija	Dolgotrajna 0.05 mg/m3; Kratkotrajna 0.05 mg/m3 Opombe: Inhalable
			Dolgotrajna 0.005 ppm; Kratkotrajna 0.005 ppm Opombe: Skin
Tip OPZ	IPRV	Litva	Dolgotrajna 0.05 mg/m3 - 0.005 ppm; Kratkotrajna 0.1 mg/m3 - 0.001 ppm

Reakcijska zmes 4,4'-metilendifenil diizocianat in o-(p-izocianatobenzil)fenil izocianat

Tip OPZ	TLV	Romunija	Kratkotrajna 0.15 mg/m3
Tip OPZ	NDS	Poljska	Dolgotrajna 0.03 mg/m3; Kratkotrajna 0.09 mg/m3

Mejna vrednost izpostavljenosti po PNEC

etil acetat

CAS: 141-78-6
Način izpostavitve: Morska voda; PNEC Omejite: 0.024 mg/l
Način izpostavitve: Sladka voda; PNEC Omejite: 0.24 mg/l
Način izpostavitve: Morski sedimenti; PNEC Omejite: 0.115 mg/kg
Način izpostavitve: Sladkovodni sedimenti; PNEC Omejite: 1.15 mg/kg
Način izpostavitve: Mikroorganizmi v čistilnih napravah (STP); PNEC Omejite: 650 mg/l
Način izpostavitve: Tla (kmetijska); PNEC Omejite: 0.148 mg/kg
Način izpostavitve: Sekundarno kazanje; PNEC Omejite: 0.2 mg/kg

4,4'-metilendifenil diizocianat

CAS: 101-68-8
Način izpostavitve: Sladka voda; PNEC Omejite: 1 mg/l
Način izpostavitve: Morska voda; PNEC Omejite: 0.1 mg/l
Način izpostavitve: Mikroorganizmi v čistilnih napravah (STP); PNEC Omejite: 1 mg/l
Način izpostavitve: Tla (kmetijska); PNEC Omejite: 1 mg/kg

Reakcijska zmes 4,4'-metilendifenil diizocianat in o-(p-izocianatobenzil)fenil izocianat

Način izpostavitve: Sladka voda; PNEC Omejite: 0.003 mg/l
Način izpostavitve: Morska voda; PNEC Omejite: 0.001 mg/l
Način izpostavitve: Sladkovodni sedimenti; PNEC Omejite: 11.7 mg/kg
Način izpostavitve: Morski sedimenti; PNEC Omejite: 1.17 mg/kg
Način izpostavitve: Prst; PNEC Omejite: 2.33 mg/kg

Izpeljane vrednosti brez učinka. (DNEL)

etil acetat

CAS: 141-78-6
Način izpostavitve: Z vdihavanjem, človek; Pogostost izpostavitve: Dolgotrajna, sistemski učinek
delavec: 734 mg/m3; Uporabnik: 367 mg/m3

Način izpostavitve: Z vdihavanjem, človek; Pogostost izpostavitve: Dolgotrajna, lokalni učinek
delavec: 734 mg/m3; Uporabnik: 367 mg/m3

Način izpostavitve: Z vdihavanjem, človek; Pogostost izpostavitve: Kratkotrajna, sistemski učinek
delavec: 1468 mg/m3; Uporabnik: 734 mg/m3

Način izpostavitve: Z vdihavanjem, človek; Pogostost izpostavitve: Kratkotrajna, lokalni učinek
delavec: 1468 mg/m3; Uporabnik: 734 mg/m3

Način izpostavitve: Dermalno, človek; Pogostost izpostavitve: Dolgotrajna, sistemski učinek
delavec: 63 mg/kg; Uporabnik: 37 mg/kg

Način izpostavitve: Oralno, človek; Pogostost izpostavitve: Dolgotrajna, sistemski učinek
Uporabnik: 4.5 mg/kg

4,4'-metilendifenil diizocianat

CAS: 101-68-8
Način izpostavitve: Z vdihavanjem, človek; Pogostost izpostavitve: Kratkotrajna, lokalni učinek
delavec: 0.1 mg/m3; Uporabnik: 0.05 mg/m3

Način izpostavitve: Z vdihavanjem, človek; Pogostost izpostavitve: Dolgotrajna, lokalni učinek
delavec: 0.05 mg/m3; Uporabnik: 0.025 mg/m3

Reakcijska zmes 4,4'-metilendifenil diizocianat in o-(p-izocianatobenzil)fenil izocianat

Način izpostavitve: Z vdihavanjem, človek; Pogostost izpostavitve: Kratkotrajna (akutna)
Industrijski delavec: 0.1 mg/m3

Način izpostavitve: Z vdihavanjem, človek; Pogostost izpostavitve: Dolgotrajna(ponavljajoča)
Industrijski delavec: 0.05 mg/m3

8.2 Nadzor izpostavljenosti

Poskrbite za ustrezno prezračevanje. Kadar je to izvedljivo, je to mogoče doseči z uporabo nadomestnega prezračevanja in dobrim splošnim vsesavanjem.

Zaščita oči:

Očala s stranskimi varovali (EN 16321).

Zaščita kože:

Osebje naj nosi antistatična oblačila iz naravnih ali sintetičnih vlaken, odpornih na visoke temperature.

Zaščita rok:

Ni materiala ali kombinacije materialov za rokavice, ki bi lahko zagotovili neomejeno odpornost na katero koli kombinacijo kemikalij ali proizvodov.

Za daljše ali večkratno rokovanje uporabite rokavice, odporne na kemikalije.

Ustrezne rokavice tipa (EN 374/EN 16523); FKM (Fluórkaučuk): debelina >= 0.4 mm; permeacijski čas >= 480 min. NBR (Nitrilkaučuk): debelina >= 0.4 mm; permeacijski čas >= 480 min

Izbira primernih rokavic ni odvisna samo od materiala, temveč tudi od drugih kakovostnih lastnosti, ki se razlikujejo od enega do drugega proizvajalca, in od načinov ter časov uporabe mešanice.

Zaščita dihalnih poti:

Če so delavci izpostavljeni koncentracijam nad mejnimi vrednostmi izpostavljenosti, morajo uporabljati primerne, certificirane dihalne aparate.

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

Nadzor izpostavljenosti okolja:

Glejte točko 6.2

Higienski in tehnični ukrepi

Glejte poglavje 7.

ODDELEK 9: Fizikalne in kemijske lastnosti

9.1 Podatki o osnovnih fizikalnih in kemijskih lastnostih

fizično stanje: Tekoče

Izgled: Tekoče

Barva: temno rjav

Vonj: saden

Tališče/ledišče: N.D.

Vrelišče ali začetno vrelišče in območje vrelišča: N.D.

Vnetljivost: Proizvod je razvrščen Flam. Liq. 2 H225

Spodnja in zgornja meja eksplozivnosti: N.D.

Plamenišče: < 23°C

Temperatura samovžiga: N.D.

Temperatura razgradnje: ni znano

pH: ni znano

Kinematična viskoznost: ni znano

Topnost v vodi: ni znano

Topnost v olju: ni znano

Porazdelitveni koeficient n-oktanol/voda (logaritemska vrednost): ni znano

Parni tlak: N.D.

Gostota in/ali relativna gostota: ni znano

Relativna parna gostota: N.D. ni znano

Lastnosti delcev:

Velikost delcev: ni znano

9.2 Drugi podatki

Eksplozivne lastnosti: ni znano

Oksidativne lastnosti: ni znano

ODDELEK 10: Obstojnost in reaktivnost

10.1 Reaktivnost

Stabilen v normalnih pogojih

10.2 Kemijska stabilnost

Stabilen v normalnih pogojih

10.3 Možnost poteka nevarnih reakcij

Zaradi toplote ali v primeru požara se lahko sprostijo ogljikovi oksidi in hlapi, ki lahko škodujejo zdravju.

Hraniti ločeno od oksidantov, močno alkalnih in močno kislih snovi, da se izognete eksotermnim reakcijam.

10.4 Pogoji, ki se jim je treba izogniti

Izogibajte se bližine toplotnih virov.

10.5 Nezdružljivi materiali

Izogibati se stiku z oksidativnimi materiali. Proizvod lahko zagori.

Glejte točko 10.3

10.6 Nevarni produkti razgradnje

V primeru pravilnega skladiščenja in ravnanja ne pride do razvoja nevarnih produktov razgradnje.

Glejte točko 5.2

ODDELEK 11: Toksikološki podatki

11.1 Podatki o razredih nevarnosti, kakor so opredeljeni v Uredbi (ES) št. 1272/2008

Toksikološki podatki izdelka:

a) akutna strupenost	Proizvod je razvrščen: Acute Tox. 4(H332)
b) jedkost za kožo/draženje kože	Proizvod je razvrščen: Skin Irrit. 2(H315)
c) resne okvare oči/draženje	Proizvod je razvrščen: Eye Irrit. 2(H319)
d) preobčutljivost pri vdihavanju in preobčutljivost kože	Proizvod je razvrščen: Resp. Sens. 1(H334), Skin Sens. 1(H317)
e) mutagenost za zarodne celice	Ni klasificirano Na podlagi razpoložljivih podatkov merila za razvrstitev niso izpolnjena.
f) rakotvornost	Proizvod je razvrščen: Carc. 2(H351)
g) strupenost za razmnoževanje	Ni klasificirano Na podlagi razpoložljivih podatkov merila za razvrstitev niso izpolnjena.
h) STOT - enkratna izpostavljenost	Proizvod je razvrščen: STOT SE 3(H335), STOT SE 3(H336)
i) STOT - ponavljajoča se izpostavljenost	Proizvod je razvrščen: STOT RE 2(H373)
j) nevarnost pri vdihavanju	Ni klasificirano Na podlagi razpoložljivih podatkov merila za razvrstitev niso izpolnjena.

Toksikološki podatki glavnih snovi, ki jih najdemo v izdelku:

etil acetat

CAS: 141-78-6	a) akutna strupenost	LD50 Oralno Podgana 4934 mg/kg LD50 Koža Zajec > 20000 mg/kg LC50 Vdihavanje hlapov Podgana > 22.5 mg/l 6h

izocianova kislina, polimetilenpolifenilen ester, polimer z .alfa.-hidro.omega.-hidroksipoli[oksi(metil-1,2-etandiil)]

CAS: 53862-89-8	a) akutna strupenost	ATE - Vdihavanje (Prahom/meglice): 1.5 mg/l ATE - Vdihavanje (Hlapi): 11 mg/l

izocianova kislina, polimetilenpolifenilen ester

CAS: 9016-87-9	a) akutna strupenost	ATE - Vdihavanje (Prahom/meglice): 1.5 mg/l LD50 Oralno Podgana > 10000 mg/kg LD50 Koža Zajec > 9400 mg/kg

4,4'-metilendifenil diizocianat

CAS: 101-68-8	a) akutna strupenost	ATE - Vdihavanje (Prahom/meglice): 1.5 mg/l LD50 Oralno Podgana > 5000 mg/kg LD50 Koža Zajec > 9400 mg/kg

Reakcijska zmes 4,4'-metilendifenil diizocianat in o-(p-izocianatobenzil)fenil izocianat

	a) akutna strupenost	ATE - Vdihavanje (Hlapi): 11 mg/l

11.2 Podatki o drugih nevarnostih

Lastnosti endokrinih motilcev:

Ni endokrinih motilcev v koncentraciji > = 0,1%.

ODDELEK 12: Ekološki podatki

Uporabljajte v skladu z dobrimi delovnimi navadami, izogibajte se odlaganju izdelka v okolju.

12.1 Strupenost

Ekotoksikološki podatki:

Ekotoksikoloških lastnosti izdelka

Ni razvrščeno kot nevarno za okolje

Za izdelek ni razpoložljivih podatkov

Seznam sestavin z ekotoksikološkimi lastnostmi

etil acetat

CAS: 141-78-6 a) akutna strupenost za vodno okolje: LC50 Riba 230 mg/l 96h

a) akutna strupenost za vodno okolje: EC50 Vodna bolha 165 mg/l 48h

izocianova kislina, polimetilenpolifenilen ester

CAS: 9016-87-9 a) akutna strupenost za vodno okolje: LC50 Riba > 1000 mg/l 96h

a) akutna strupenost za vodno okolje: LC50 Vodna bolha > 1000 mg/l 24h

b) kronična strupenost za vodno okolje: NOEC Vodna bolha > 10 mg/l - 21d

a) akutna strupenost za vodno okolje: ErC50 Alge > 1640 mg/l 72h

4,4'-metilendifenil diizocianat

CAS: 101-68-8 a) akutna strupenost za vodno okolje: LL50 Riba > 100 mg/l 96h

a) akutna strupenost za vodno okolje: EC50 Vodna bolha > 1000 mg/l 24h

a) akutna strupenost za vodno okolje: EL50 Alge > 100 mg/l 72h

b) kronična strupenost za vodno okolje: NOEC Vodna bolha > 10 mg/l - 21d

12.2 Obstojnost in razgradljivost

Uporabljajte v skladu z dobro delovno prakso, pri čemer se izogibajte razprševanju izdelka v okolje. Če izdelek prodre v vodotoke ali onesnaži zemljo ali rastlinstvo, obvestite pristojne organe.

etil acetat

CAS: 141-78-6 Hitro razgradljivo

izocianova kislina, polimetilenpolifenilen ester, polimer z .alfa.-hidro.omega.-hidroksipoli[oksi(metil-1,2-etandiil)]

CAS: 53862-89-8 Ni hitro razgradljivo

izocianova kislina, polimetilenpolifenilen ester

CAS: 9016-87-9 Ni hitro razgradljivo

4,4'-metilendifenil diizocianat

CAS: 101-68-8 Ni hitro razgradljivo

12.3 Zmožnost kopičenja v organizmih

4,4'-metilendifenil diizocianat

CAS: 101-68-8 Se ne kopiči v organizmih

12.4 Mobilnost v tleh

4,4'-metilendifenil diizocianat

CAS: 101-68-8 Testiranje: Log Koc; Vrednost: 4.500

12.5 Rezultati ocene PBT in vPvB

Na podlagi razpoložljivih podatkov, preparat ne vsebuje snovi PBT/vPvB v procentu ≥ 0.1%.

12.6 Lastnosti endokrinih motilcev

Ni endokrinih motilcev v koncentraciji > = 0,1%.

12.7 Drugi škodljivi učinki

ni znano

ODDELEK 13: Odstranjevanje

13.1 Metode ravnanja z odpadki

Če je mogoče, predelajte. Pošljite v usposobljena odlagališča ali v zažig pod kontroliranimi pogoji. Ravnajte se po lokalnih in državnih predpisih.

Ne dopustite, da pride v kanalizacijo ali vodne poti.

Odstraniti posode, ki jih kontaminira izdelka v skladu z lokalnimi ali nacionalnimi predpisi.

Ko izdelku poteče življenjska doba, ga odstranite v skladu z veljavno zakonodajo.

ODDELEK 14: Podatki o prevozu



14.1 Številka ZN in številka ID

1866

14.2 Pravilno odpremno ime ZN

ADR-uradno ime blaga: RESIN SOLUTION

IATA-uradno ime blaga: RESIN SOLUTION

IMDG-uradno ime blaga: RESIN SOLUTION

14.3 Razredi nevarnosti prevoza

ADR-Razred: 3

IATA-razred: 3

IMDG-razred: 3

14.4 Skupina embalaže

ADR-embalažna skupina: II

IATA-embalažna skupina: II

IMDG-embalažna skupina: II

14.5 Nevarnosti za okolje

Onesnaževalec morja: Ne

Onesnažuje okolje po: Ne

IMDG-EMS: F-E, S-E

14.6 Posebni previdnostni ukrepi za uporabnika

Cestni in železniški transport (ADR-RID):

ADR-nalepka nevarnosti: 3

ADR - Identifikacijska številka nevarnosti: 33

ADR-posebni ukrepi: 640C

ADR-Pravilnik o cestnem prevozu nevarnega blaga:

Zračni transport (IATA):

IATA-potniška letala: 353

IATA-tovorna letala: 364

IATA-nalepka: 3

IATA-dodatne nevarnosti: -

IATA-Erg: 3L

IATA-posebni ukrepi: A3

Morski transport (IMDG):

IMDG-Zlaganje in ravnanje: Category B

IMDG-Segregacija: -

IMDG-dodatne nevarnosti: -

IMDG-posebni ukrepi: -

14.7 Pomorski prevoz v razsutem stanju v skladu z instrumenti IMO

ni znano

ODDELEK 15: Zakonsko predpisani podatki

15.1 Predpisi/zakonodaja o zdravju, varnosti in okolju, specifični za snov ali zmes

Dir. 98/24/ES (Varovanje delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu)

Dir. 2000/39/ES (mejne vrednosti za poklicno izpostavljenost)

Direktiva 2010/75/EU

Uredba (ES) št. 1907/2006 (REACH)

Uredba (ES) št. 1272/2008 (CLP)

Uredba (ES) št. 790/2009 (1. ATP CLP) in (EU) št. 758/2013

Uredba (EU) 2020/878

Uredba (EU) št. 286/2011 (2. ATP CLP)

Uredba (EU) št. 618/2012 (3. ATP CLP)

Uredba (EU) št. 487/2013 (4. ATP CLP)

Uredba (EU) št. 944/2013 (5. ATP CLP)

Uredba (EU) št. 605/2014 (6. ATP CLP)

Uredba (EU) 2015/1221 (7. ATP CLP)

Uredba (EU) 2016/918 (8. ATP CLP)

Uredba (EU) 2016/1179 (9. ATP CLP)

Uredba (EU) 2017/776 (10. ATP CLP)
Uredba (EU) 2018/669 (11. ATP CLP)
Uredba (EU) 2018/1480 (13. ATP CLP)
Uredba (EU) 2019/521 (12. ATP CLP)
Uredba (EU) 2020/217 (14. ATP CLP)
Uredba (EU) 2020/1182 (15. ATP CLP)
Uredba (EU) 2021/643 (16. ATP CLP)
Uredba (EU) 2021/849 (17. ATP CLP)
Uredba (EU) 2022/692 (18. ATP CLP)
Uredba (EU) 2023/707
Uredba (EU) 2023/1434 (19. ATP CLP)
Uredba (EU) 2023/1435 (20. ATP CLP)
Uredba (EU) 2024/197 (21. ATP CLP)
Uredba (EU) 2024/2564 (22. ATP CLP)
Uredba (EU) ąt. 2024/2865
Uredba (EU) 2025/1222 (23. ATP CLP)

Omejitve, povezane z izdelkom ali vsebovanimi snovmi, v skladu s Prilogo XVII Uredbe (ES) 1907/2006 (REACH) in poznejše spremembe:

Omejitve v zvezi z izdelkom: 3, 40

Omejitve v zvezi z vsebovanimi snovmi: 56, 74, 75

Določbe v zvezi z direktivo EU 2012/18 (Seveso III)

Kategorija Seveso III v skladu s Prilogo 1, del 1	Mejna vrednost nižje stopnje (v tonah)	Mejna vrednost višje stopnje (v tonah)
izdelek spada v kategorijo: P5c	5000	50000

Uredba (EU) št. 649/2012 (uredba PIC)

Snovi niso navedene

Nemški razred nevarnosti za vodo.

Razred 3: izjemno nevarna.

SVHC snovi:

Na podlagi razpoložljivih podatkov, preparat ne vsebuje snovi SVHC v procentu ≥ 0.1%.

Mejna vrednost EU za vsebnost HOS (Direktiva 2004/42/ES) Kat. A/h: 750 g/l; HOS < 750 g/l

15.2 Ocena kemijske varnosti

Ocena kemijske varnosti ni bila opravljena za zmes.

ODDELEK 16: Drugi podatki

Številka	Opis
EUH066	Ponavljajoča izpostavljenost lahko povzroči nastanek suhe ali razpokane kože.
H225	Lahko vnetljiva tekočina in hlapi.
H315	Povzroča draženje kože.
H317	Lahko povzroči alergijski odziv kože.
H319	Povzroča hudo draženje oči.
H332	Zdravju škodljivo pri vdihavanju.
H334	Lahko povzroči simptome alergije ali astme ali težave z dihanjem pri vdihavanju.
H335	Lahko povzroči draženje dihalnih poti.
H336	Lahko povzroči zaspanost ali omotico.
H351	Sum povzročitve raka.
H373	Lahko škoduje organom pri dolgotrajni ali ponavljajoči se izpostavljenosti.
H373	V primeru dolgotrajnega ali ponovljenega vdihavanja lahko povzroči poškodbe notranjih organov.
H373	V primeru dolgotrajnega ali ponovljenega vdihavanja lahko povzroči poškodbe notranjih organov (respiratorni trakt).

Številka	Razred in kategorija nevarnosti	Opis
2.6/2	Flam. Liq. 2	Vnetljiva tekočina, Kategorija 2
3.1/4/Inhal	Acute Tox. 4	Akutna strupenost (pri vdihavanju), Kategorija 4
3.2/2	Skin Irrit. 2	Draženje kože, Kategorija 2
3.3/2	Eye Irrit. 2	Draženje oči, Kategorija 2
3.4.1/1	Resp. Sens. 1	Preobčutljivost dihal, Kategorija 1

3.4.2/1	Skin Sens. 1	Preobčutljivost kože, Kategorija 1
3.6/2	Carc. 2	Rakotvornost, Kategorija 2
3.8/3	STOT SE 3	Specifična strupenost za ciljne organe (STOT) – enkratna izpostavljenost STOT enkrat, Kategorija 3
3.9/2	STOT RE 2	Specifična strupenost za ciljne organe (STOT) – ponavljajoča se izpostavljenost, Kategorija 2

Razvrstitev in postopek, uporabljen za izpeljavo razvrstitve za zmesi v skladu z Uredbo (ES) 1272/2008 [uredba CLP]:

Razvrstitev v skladu z Uredbo (ES) št. 1272/2008	Postopek razvrščanja
Flam. Liq. 2, H225	na podlagi podatkov o preskusih
Acute Tox. 4, H332	metoda izračuna
Skin Irrit. 2, H315	metoda izračuna
Eye Irrit. 2, H319	metoda izračuna
Resp. Sens. 1, H334	metoda izračuna
Skin Sens. 1, H317	metoda izračuna
Carc. 2, H351	metoda izračuna
STOT SE 3, H335	metoda izračuna
STOT SE 3, H336	metoda izračuna
STOT RE 2, H373	metoda izračuna

Ta dokument je pripravila pristojna oseba, ki je ustrezno usposobljena

Glavni bibliografski viri:

ECDIN – Informacijska mreža za okoljske podatke za kemikalije – Skupno raziskovalno središče, Komisija Evropskih skupnosti

SAX – NEVARNE LASTNOSTI INDUSTRIJSKIH MATERIALOV – 8. izdaja – Van Nostrand Reinold

Varnostni listi dobaviteljev surovin.

Predstavljene informacije se nanašajo na naše znanje v zgoraj navedenem datumu. Nanašajo se zgolj na omenjeni izdelek in ne predstavljajo garancije za posebno kakovost.

Uporabnik je dolžan preveriti pravilnost in popolnost teh informacij glede na svojo specifično uporabo.

Ta list razveljavlja in nadomešča vsako predhodno izdajo

Legenda okrajšav in kratic, uporabljenih v varnostnem listu:

ACGIH: Ameriška konferenca vladnih industrijskih higienikov

ADR: Evropski sporazum o mednarodnem prevozu nevarnih snovi v cestnem prometu.

ATE: Ocena akutne strupenosti

ATEmix: Ocena akutne strupenosti (Zmesi)

BEI: Biološki indeks izpostavljenosti

CAS: Chemical Abstracts Service (oddelek Ameriškega kemijskega društva).

CAV: Center za zastrupitve

CE: Evropska skupnost

CLP: Razvrščanje, etiketiranje, pakiranje.

CMR: Rakotvorno, mutageno in strupeno za razmnoževanje

COV: Hlapna organska spojina

CSA: Ocena kemijske varnosti

CSR: Poročilo o kemijski varnosti

DNEL: Izpeljane vrednosti brez učinka.

EC50: Srednja učinkovita koncentracija

ECHA: Evropska agencija za kemikalije

EINECS: Evropski seznam obstoječih snovi.

ES: Scenarij izpostavljenosti

GefStoffVO: Odlok o nevarnih snoveh, Nemčija.

GHS: Globalno poenoten sistem razvrščanja in označevanja nevarnih kemikalij.

IARC: Mednarodna agencija za raziskovanje raka

IATA: Mednarodno združenje za zračni transport.

IC50: Srednja inhibitorna koncentracija

IMDG: Mednarodni kodeks za prevoz nevarnega blaga po morju

LC50: Letalna koncentracija za 50 odstotkov testne populacije.

LD50: Letalna doza za 50 odstotkov testne populacije.

LDLo: Najnižja smrtna doza

N.A.: Se ne uporablja

N/A: Se ne uporablja

N/D: Ni opredeljeno/Ni razpoložljiv

N.D.: Ni razpoložljiv

NIOSH: Nacionalni inštitut za varnost in zdravje pri delu
NOAEL: Raven brez opaznih negativnih vplivov
OSHA: Upravljanje varnosti in zdravja pri delu
PBT: Obstojne, se kopičijo v organizmih in so strupene
PGK: Navodila za embalažo nevarnih snovi
PNEC: Predvidena koncentracija brez učinka.
PSG: Potniki
RID: Pravilnik o mednarodnem prevozu nevarnega blaga po železnici.
STEL: Meja za kratkotrajno izpostavljenost.
STOT: Specifično strupeno za ciljne organe.
TLV: Mejna vrednost izpostavljenosti.
TLV-TWA: Mejna vrednost izpostavljenosti v časovnem obdobju po 8 ur dnevno (ACGIH standard).
vPvB: Telo obstojno, se zelo lahko kopiči v organizmih.
WGK: Nemški razred nevarnosti za vodo.

Odstavki spremenjeni od prejšnje revizije:

- Varnostni list
- ODDELEK 1: Identifikacija snovi/zmesi in družbe/podjetja
- ODDELEK 2: Določitev nevarnosti
- ODDELEK 3: Sestava/podatki o sestavinah
- ODDELEK 7: Ravnanje in skladiščenje
- ODDELEK 8: Nadzor izpostavljenosti/osebna zaščita
- ODDELEK 9: Fizikalne in kemijske lastnosti
- ODDELEK 11: Toksikološki podatki
- ODDELEK 12: Ekološki podatki
- ODDELEK 14: Podatki o prevozu
- ODDELEK 15: Zakonsko predpisani podatki
- ODDELEK 16: Drugi podatki

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.