Durante Adesivi SpA - Via G. Garibaldi, 23 33080 Prata di Pordenone (PN) | Italy
Sigurnosno-tehničkog lista
DUDITERM PU 159/LM
Sigurnosno-tehničkog lista, datum: 3.12.2025. Opis version 9

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

1.1. Identifikacijska oznaka proizvoda

Trgovačko ime: DUDITERM PU 159/LM

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

Preporučana upotreba: Poliuretanska vruća talina reaktivna ljepila, industrijska i profesionalna uporaba.
Nepreporučljiva upotreba: Ne primjenjuje se.

1.3. Podaci o dobavljaču koji isporučuje sigurnosno-tehnički list

Tvrtka:

Durante Adesivi SpA
Via G. Garibaldi, 23
33080 Prata di Pordenone (PN) | Italy
Tel. 0039 0434 605211

E-mail nadležna osoba:

safety@duranteadesivi.com

1.4. Broj telefona za izvanredna stanja

Österreich: 01 406 43 43
België: 070 245 245
Bălgarija: 02 9154 411 +359 2 9154 233
Hrvatska: +3851 2348 342 ; 01 2348 342
Cyprus: 1401
Česká republika: +420 224 919 293, +420 224 915 402
Danmark: +45 82 12 12 12
Eesti: 16662; +372 7943 794
Finland: 0800 147 111; 09 471 977
France: ORFILA number (INRS): + 33 (0)1 45 42 59 59
Deutschland: +49 551-19240
Elláda: +30 21 07 79 37 77
Magyarország: +36 80 201 199 only from Hungary ; +36 1 476 6464 (also from abroad)
Ísland: +354 543 22 22
Éire: +353 01 809 2566
Latvija: 112 ; +371 67042473
Lietuva: +370 8-5 236 20 52
Luxembourg: +352 80025500
Malta: 1579
Nederland: +31 (0)88 755 8000
Norge: 22 59 13 00 ; 113
Poland: 112
Portugal: +351 800 250 250
România: +40213183606
Slovensko: +421 2 5477 4166
Slovenija: 112
España: +34 91 562 04 20
Sverige: 112 (urgent cases) ; 010-456-6700 (less urgent cases)

ODJELJAK 2.: Identifikacija opasnosti

2.1. Razvrstavanje tvari ili smjese

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

U skladu s Pravilnikom EC 1272/2008 (CLP) proizvod se ne smatra opasan.

Fizikalno-kemijski učinci štetni po ljudsko zdravlje i okoliš:

Nema ostalih rizika

2.2. Elementi označivanja

U skladu s Pravilnikom EC 1272/2008 (CLP) proizvod se ne smatra opasan.

Posebna osiguranja:

EUH204 Sadrži izocianate. Može izazvati alergijsku reakciju.

EUH210 Sigurnosno-tehnički list dostupan na zahtjev.

Sadržaj:

Phenol, 2,4-bis[(dodecylthio)methyl]-6-methyl- Može izazvati alergijsku reakciju.

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

Niti jedan

2.3. Ostale opasnosti

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

Ostali rizici:

Nema ostalih rizika

ODJELJAK 3.: Sastav/informacije o sastojcima

3.1. Tvari

Ne primjenjuje se.

3.2. Smjese

Identifikacija preparata: DUDITERM PU 159/LM

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

Količina	Naziv	Ident. Broj.	Klasifikacija	Broj registriranih slučajeva
1≤x<2.4 %	Bis(4-(1,1,3,3-tetramethylbutyl)phenyl)amine	CAS:15721-78-5 EC:239-816-9	Aquatic Chronic 3, H412	01-2119930672-39
0.1≤x<0.5 %	Phenol, 2,4-bis[(dodecylthio)methyl]-6-methyl-	CAS:110675-26-8 EC:438-600-3	Skin Sens. 1, H317; Aquatic Chronic 3, H412	01-0000018334-73
<0.1 %	difenilmetan-2,4'-diizocianat	CAS:5873-54-1 EC:227-534-9 Index:615-005-00-9	Skin Irrit. 2, H315 Eye Irrit. 2, H319 Resp. Sens. 1, H334 STOT SE 3, H335, H334 Carc. 2, H351 STOT RE 2, H373 Skin Sens. 1, H317 Acute Tox. 4, H332 Specifične granične vrijednosti koncentracije: C ≥ 5%: Skin Irrit. 2 H315 C ≥ 5%: Eye Irrit. 2 H319 C ≥ 0.1%: Resp. Sens. 1 H334 C ≥ 5%: STOT SE 3 H335	01-2119480143-45

ODJELJAK 4.: Mjere prve pomoći

4.1. Opis mjera prve pomoći

U slučaju kontakta sa kožom:

U slučaju kontakta s rastopljenim proizvodom, odmah ohladite hladnom vodom. Ne uklanjajte proizvod prianjaju na kožu. Posavjetujte se s liječnikom.

Isprati s puno vode i sapunom.

U slučaju kontakta sa očima:

U slučaju kontakta s rastopljenim proizvodom, odmah ohladite hladnom vodom. Posavjetujte se s liječnikom.

Odmah isprati vodom.

U slučaju gutanja:

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

U slučaju udisanja:

Izvadite poticaj na svježi zrak i držite toplo i u mirovanju. Posavjetujte se s liječnikom.

4.2. Najvažniji simptomi i učinci, akutni i odgođeni

Ne primjenjuje se.

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

Ne primjenjuje se.

ODJELJAK 5.: Mjere za suzbijanje požara

5.1. Sredstva za gašenje

Prikladna sredstva za gašenje požara:

Voda.

Ugljik dioksid (CO_2).

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

Nijedna

5.2. Posebne opasnosti koje proizlaze iz tvari ili smjese

Ne udisati plinove koji nastanu uslijed eksplozije i sagorijevanja.

Sagorijevanjem se oslobađaju teški dimovi.

5.3. Savjeti za gasitelje požara

Oprema: Normalna odjeća za borbu protiv vatre, kao što je otvoreni aparat za disanje komprimiranog zraka (EN 137), odijelo za usporavanje plamena (EN 469), rukavice za retardiranje plamena (EN 659) i čizme za vatrogasce (HO A29 ili A30).

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

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

ODJELJAK 6.: Mjere kod slučajnog ispuštanja

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

Ovi pokazatelji vrijede i za osoblje obradu i onih koji su uključeni u postupke hitne.

Koristiti sredstva za osobnu zaštitu.

Ukloniti osobe na sigurno mjesto.

Konzultirati mjere zaštite opisane u točkama 7. i 8.

Za interventno osoblje:

Koristiti sredstva za osobnu zaštitu.

6.2. Mjere zaštite okoliša

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

Zadržati vodu kojom ste izvršili pranje, pa je eliminirati.

U slučaju ulaska u plovne putove, tla ili odvoda, obavijestite odgovorne vlasti.

Prikladan materijal za sakupljanje tvari: upijajući, organski materija, pijesak

6.3. Metode i materijal za sprečavanje širenja i čišćenje

Ostavite da se stvrdnu. Uklonite mehanički.

Prikladan materijal za sakupljanje tvari: upijajući, organski materija, pijesak

Oprati sa dosta vode.

6.4. Uputa na druge odjeljke

Pogledati također i paragrafe 8. i 13.

ODJELJAK 7.: Rukovanje i skladištenje

7.1. Mjere opreza za sigurno rukovanje

Izbjegavati kontakt sa kožom i očima, udisanje pare i magle.

Ne konzumirati hranu i piće na radnom mjestu.

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

7.2. Uvjeti sigurnog skladištenja, uzimajući u obzir moguće inkompatibilnosti

Čuvajte na hladnom i suhom mjestu.

Inkompatibilne tvari:

Provjerite odjeljak 10.

Upute za prostorije za skladištenje:

Adekvatno prozračene prostorije.

7.3. Posebna krajnja uporaba ili uporabe

Pogledajte izložbu scenarije u prilogu ovog sigurnosnog lista ako je prisutan.

Preporuke

Nema posebne upotrebe

Specifične otopine za industrijski sektor

Nema posebne upotrebe

ODJELJAK 8.: Nadzor nad izloženošću/osobna zaštita

8.1. Nadzorni parametri

Granične vrijednosti izloženosti PNEC

	PNEC Ograničiti	Putevi izloženosti	Učestalost izloženosti	Primjedbe
difenilmetan-2,4'-diizocianat CAS: 5873-54-1	3.7 µg/L	Voda		
	0.37 µg/L	Morska voda		
	2.33 mg/kg	Tlo (poljoprivredno)		
	37 µg/L	Voda s povremenim oslobađanjem		
	11.7 mg/kg	Sedimenti svježe vode		
	1.17 mg/kg	Sedimenti morske vode		

Izvedena razina bez učinka. (DNEL)

	Industrijski djelatnik	Profesionalni djelatnik	Potrošač	Putevi izloženosti	Učestalost izloženosti	Primjedbe
difenilmetan-2,4'-diizocianat CAS: 5873-54-1	0.1 mg/m3		0.05 mg/m3	Human Inhalation	Short Term, local effects	
	0.05 mg/m3		0.025 mg/m3	Human Inhalation	Long Term, local effects	

8.2. Nadzor nad izloženošću

Izbor osobne zaštitne opreme se mora izvršiti na temelju kemijske procjene rizika. Sva OZO mora biti u skladu s odgovarajućim CE standardima, zadržao učinkovit i pohranjeni na prikladan način. Trajanje OZO ovisi o raznim faktorima (vrsta uporabe, načinu skladištenja, klimatski čimbenici), koji se također može značajno smanjiti vrijeme upotrebljivosti potreban CE standardu. Uvijek konzultirajte dobavljača zaštitne opreme. Uputiti radnika u korištenju naprave koje su predviđene.

Zaštita očiju:

Nositi zaštitne naočale prema EN 166

Zaštita kože:

Nosite radnu odjeću i obuću sigurnosti za profesionalnu uporabu.

Zaštita za ruke:

Nosite termalne rukavice kada se koristi rastopljeni ljepila.

penetracije trošenje otporne radne rukavice (EN 374).

Zaštita pri disanju:

Osigurati dobro provjetravanje / aspiracija.

Toplinski rizici:

Nosite termalne rukavice kada se koristi rastopljeni ljepila.

Kontrola izlaganja u okolišu:

Emisije iz proizvodnih procesa, uključujući i one iz ventilacijske opreme, moraju se kontrolirati u skladu s propisima o zaštiti okoliša.

Za više informacija o kontroli izloženosti okoliša odnose se na scenarijima izloženosti, ako je primjenjivo.

Higijenske i tehničke mjere

Ne primjenjuje se.

ODJELJAK 9.: Fizikalna i kemijska svojstva

9.1. Informacije o osnovnim fizikalnim i kemijskim svojstvima

fizičko stanje: U krutom stanju

Boja: Prirodna boja

Miris: svojstveno

pH: Ne primjenjuje se.

Kinematička viskoznost: Ne primjenjuje se.

Točka topljenja/smrzavanja: Ne primjenjuje se.

Početna točka ključanja i vrijeme ključanja: Ne primjenjuje se.

Plamište: Ne primjenjuje se.
Gornja/donja granica zapaljivosti ili eksplozije: Ne primjenjuje se.
Gustoća para: Ne primjenjuje se.
Tlak pare: Ne primjenjuje se. NA
Relativna gustoća: 1.20 g/ml
Topljivost u vodi: Reagira
Topljivost u ulje: Ne primjenjuje se.
Koeficijent raspodjele (n-okanol/voda): Ne primjenjuje se.
Temperatura samozapaljenja: Ne primjenjuje se.
Temperatura raspadanja: Ne primjenjuje se.
Zapaljivost: Ne primjenjuje se.
Hlapivi organski spoj - HOS = Ne primjenjuje se.

Svojstva čestica:

Veličina čestica: Ne primjenjuje se.

9.2. Ostale informacije

Viskozitet : 72,500.00 mPa-s @ 140.00 °C
Mješljivost: Ne primjenjuje se.
Vodljivost: Ne primjenjuje se.
Brzina isparavanja: Ne primjenjuje se.
Nema drugih relevantnih informacija

ODJELJAK 10.: Stabilnost i reaktivnost

10.1. Reaktivnost

Stabilan u normalnim uvjetima

10.2. Kemijska stabilnost

Stabilan u normalnim uvjetima

10.3. Mogućnost opasnih reakcija

Nijedan.

10.4. Uvjeti koje treba izbjegavati

Stabilno u normalnim uvjetima.

10.5. Inkompatibilni materijali

Nijednu osobito.

10.6. Opasni proizvodi raspadanja

Nijedan.

ODJELJAK 11.: Toksikološke informacije

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

Podaci o toksičnosti proizvoda:

a) akutna toksičnost	Nije kategorizirano
	Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.
b) kožno nagrizanje/nadraživanje	Nije kategorizirano
	Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.
c) teške očne ozljede/teško očno nadraživanje	Nije kategorizirano
	Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.
d) izazivanje kožne ili dišne preosjetljivosti	Nije kategorizirano
	Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.
e) mutagenost zametnih stanica	Nije kategorizirano
	Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.
f) kancerogenost	Nije kategorizirano
	Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.
g) reproduktivna toksičnost	Nije kategorizirano
	Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.
h) Specifična toksičnost za ciljne organe (STOT) jednokratno izlaganje	Nije kategorizirano
	Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.

i) Specifična toksičnost za ciljne organe (STOT) opetovano izlaganje	Nije kategorizirano
	Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.
j) opasnost u slučaju udisanja	Nije kategorizirano
	Na temelju dostupnih podataka kriteriji za razvrstavanje nisu ispunjeni.

Podaci o toksičnosti glavnih sastojaka u proizvodu:

Phenol, 2,4-bis[(dodecylthio)methyl]-6-methyl-	a) akutna toksičnost	LD50 Oralno Štakor > 5000 mg/kg	OECD 401
		LD50 Koža Štakor > 2000 mg/kg	OECD 402
difenilmetan-2,4'-diizocianat	a) akutna toksičnost	LD50 Oralno Štakor > 2000 mg/kg	84/449/EEC
		LD50 Koža Kunić > 9400 mg/kg t.m.	OECD 402
		ATE Udisanje 1.5 mg/L, 4h	Calculation method
	b) kožno nagrizanje/nadraživanje	Nadražuje kožu Kunić	OECD 404
	d) izazivanje kožne ili dišne preosjetljivosti	Čini kožu preosjetljivom Zamorac Negativno	OECD 406
		Čini kožu preosjetljivom Štakor Pozitivno	OECD TG 429
		Senzibilizacija uslijed gutanja Zamorac Pozitivno	
	e) mutagenost zametnih stanica	Genotoksičnost Štakor Negativno	OECD 474
	f) kancerogenost	Kancerogenost Štakor Pozitivno	OECD 453

11.2. Informacije o drugim opasnostima

Svojstva endokrine disrupcije:

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

ODJELJAK 12.: Ekološke informacije

12.1. Toksičnost

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

Eko-Toksikološke informacije:

Popis eko-toksikoloških svojstava proizvoda

Nije razvrstan kao opasan za okoliš

Nema raspoloživih podataka za proizvod

Popis sastojaka sa eko-toksikološkim svojstvima

Sastojak	Ident. Broj.	Ekotoksik. Informacije
Phenol, 2,4-bis[(dodecylthio)methyl]-6-methyl-	CAS: 110675-26-8 - EINECS: 438-600-3	a) Akutna otrovnost na vodene organizme : LC50 Ribe > 10 mg/L 96h
		a) Akutna otrovnost na vodene organizme : EC50 Daphnia > 10 mg/L 48h
		a) Akutna otrovnost na vodene organizme : EC10 Algae > 10 mg/L 72h
difenilmetan-2,4'-diizocianat	CAS: 5873-54-1 - EINECS: 227-534-9 - INDEX: 615-005-00-9	a) Akutna otrovnost na vodene organizme : EL50 Daphnia Daphnia magna 3.7 mg/L 48h
		b) Hronična otrovnost na vodene organizme : NOEC Daphnia Daphnia magna 10 mg/L 21d Freshwater - OECS TG 211

12.2. Postojanost i razgradivost

Sastojak	Postojanost/razgradivost:	Test	Trajanje	Vrijednost	Napomene:

Phenol, 2,4-bis[(dodecylthio)methyl]-6-methyl-	Nije brzo-biološki razgradiv				
difenilmetan-2,4'-diizocianat	Nije brzo-biološki razgradiv	Biochemical oxigen demand	28d	0.000	OECD TG 302C

12.3. Bioakumulacijski potencijal

Sastojak	Bioakumulativnost	Test	Vrijednost	Napomene:
difenilmetan-2,4'-diizocianat	Nije bioakumulativan	BCF - Bioconcentrantion factor	200	Cyprinus carpio (OECD 305 E)
		Kow - Partition coefficient	4.520	22°C, pH 7

12.4. Pokretljivost u tlu

Ne primjenjuje se.

12.5. Rezultati procjene svojstava PBT i vPvB

Nema PBT-a, vPvB-a komponente prisutnih u koncentraciji > = 0,1 %.

12.6. Svojstva endokrine disrupcije

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

12.7. Ostali štetni učinci

Ne primjenjuje se.

ODJELJAK 13.: Zbrinjavanje

13.1. Metode obrade otpada

Regenerirati ako je moguće. Pri tome se pridržavati propisanih lokalnih i državnih propisa.

ODJELJAK 14.: Informacije o prijevozu

Nije klasificirano kao opasno po propisima za transport.

14.1. UN broj ili identifikacijski broj

Ne primjenjuje se.

14.2. Ispravno otpremno ime prema UN-u

Ne primjenjuje se.

14.3. Razred(i) opasnosti pri prijevozu

Ne primjenjuje se.

14.4. Skupina pakiranja

Ne primjenjuje se.

14.5. Opasnosti za okoliš

Ne primjenjuje se.

14.6. Posebne mjere opreza za korisnika

Ne primjenjuje se.

Ceste i Željeznica (ADR-RID):

Ne primjenjuje se.

Zrak (IATA):

Ne primjenjuje se.

More (IMDG):

Ne primjenjuje se.

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

Ne primjenjuje se.

ODJELJAK 15.: Informacije o propisima

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

Direktiva 98/24/EC (Rizici koji nastaju od kemijskih agenasa na radu)
Direktiva 2000/39/EC (Granična vrijednost profesionalne izloženosti)
Uredba (EC) br. 1907/2006 (REACH)
Uredba (EC) br. 1272/2008 (CLP)
Uredba (EC) br. 790/2009 (ATP 1 CLP) i (EZ) br. 758/2013
Uredba (EZ) br. 2020/878
Uredba (EZ) br. 286/2011 (ATP 2 CLP)
Uredba (EZ) br. 618/2012 (ATP 3 CLP)
Uredba (EZ) br. 487/2013 (ATP 4 CLP)

Uredba (EZ) br. 944/2013 (ATP 5 CLP)
Uredba (EZ) br. 605/2014 (ATP 6 CLP)
Uredba (EZ) br. 2015/1221 (ATP 7 CLP)
Uredba (EZ) br. 2016/918 (ATP 8 CLP)
Uredba (EZ) br. 2016/1179 (ATP 9 CLP)
Uredba (EZ) br. 2017/776 (ATP 10 CLP)
Uredba (EZ) br. 2018/669 (ATP 11 CLP)
Uredba (EZ) br. 2018/1480 (ATP 13 CLP)
Uredba (EZ) br. 2019/521 (ATP 12 CLP)
Uredba (EZ) br. 2020/217 (ATP 14 CLP)
Uredba (EZ) br. 2020/1182 (ATP 15 CLP)
Uredba (EZ) br. 2021/643 (ATP 16 CLP)
Uredba (EZ) br. 2021/849 (ATP 17 CLP)
Uredba (EZ) br. 2022/692 (ATP 18 CLP)
Regulation (EU) n. 2023/707
Regulation (EU) n. 2023/1434 (ATP 19 CLP)
Regulation (EU) n. 2023/1435 (ATP 20 CLP)
Regulation (EU) n. 2024/197 (ATP 21 CLP)

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

Ograničenja koja se odnose na proizvod: Niti jedan

Ograničenja koja se odnose na sadržane tvari: 75

Njemačka klasifikacija opasnosti za vodu.

ne obračunava

SVHC tvari:

Nema SVHC-a komponente prisutnih u koncentraciji > = 0,1 %.

15.2. Procjena kemijske sigurnosti

Procjena kemijske sigurnosti nije provedena za smjesu

Tvari za koje je provedena procjena kemijske sigurnosti

difenilmetan-2,4'-diizocianat

ODJELJAK 16.: Ostale informacije

Šifra	Opis
H315	Nadražuje kožu.
H317	Može izazvati alergijsku reakciju na koži.
H319	Uzrokuje jako nadraživanje oka.
H332	Štetno ako se udiše.
H334	Ako se udiše može izazvati simptome alergije ili astme ili poteškoće s disanjem.
H335	Može nadražiti dišni sustav.
H351	Sumnja na moguće uzrokovanje raka.
H373	Može uzrokovati oštećenje organa tijekom produljene ili ponavljane izloženosti.
H412	Štetno za vodeni okoliš s dugotrajnim učincima.

Šifra	Razred opasnosti i kategorija opasnosti	Opis
3.1/4/Inhal	Acute Tox. 4	Akutna toksičnost (udisanje), kategorija 4
3.2/2	Skin Irrit. 2	Nadražujuće za kožu, kategorija 2
3.3/2	Eye Irrit. 2	Nadražujuće za oči, kategorija 2
3.4.1/1	Resp. Sens. 1	Izazivanje preosjetljivosti dišnih putova, kategorija 1
3.4.2/1	Skin Sens. 1	Izazivanje preosjetljivosti kože, kategorija 1
3.6/2	Carc. 2	Karcinogenost, Kategorija 2
3.8/3	STOT SE 3	Specifična toksičnost za ciljane organe – jednokratno izlaganje, Kategorija 3
3.9/2	STOT RE 2	Specifična toksičnost za ciljane organe – ponavljano izlaganje, Kategorija 2
4.1/C3	Aquatic Chronic 3	Kroničnu (dugoročnu) opasnost za organizme koji žive u vodi, kategorija 3

Klasifikacija proizvoda temelji se na metodama izračuna iz Priloga I. CLP-a, osim ako nije drugačije navedeno u točkama 11. i 12.The metoda za procjenu kemijsko-fizikalna svojstva prikazuju se u odjeljku 9..

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

Glavni bibliografski izvori:

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

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

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

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

Ovaj MSDS poništava i zamjenjuje sva predhodna izdanja.

Legenda kratica i akronima upotrebljenih u sigurnosno-tehničkom listu:

ACGIH: Američka konferencija vladinih specijalista za industrijsku higijenu

ADR: Europski sporazum o međunarodnom cestovnom prijevozu opasnih tvari.

AND: Europski sporazum o međunarodnom prijevozu opasne robe po unutarnjim plovnim putovima

ATE: Procjena akutne toksičnosti

ATEmix: Procijenjena vrijednost akutne toksičnosti (Mješavine)

BCF: Čimbenik biološke koncentracije

BEI: Indeks biološke izloženosti

BOD: Biokemijska potreba kisika

CAS: CAS registarski broj (Američko kemijsko društvo)

CAV: Centar za otrove

CE: Europska zajednica

CLP: Razvrstavanje, označavanje, pakiranje.

CMR: Karcinogeno, Mutageno i Reprotoksično

COD: Kemijska potreba kisika

COV: Hlapivi organski spoj

CSA: Procjena kemijske sigurnosti

CSR: Izvješće o kemijskoj sigurnosti

DMEL: Izvedena minimalna razina učinka

DNEL: Izvedena razina bez učinka.

DPD: Direktiva o opasnim preparatima

DSD: Direktiva o opasnim tvarima

EC50: Pulu maksimalna efektivna koncentracija

ECHA: Europska agencija za kemijske proizvode

EINECS: Europski propis postojećih trgovačkih kemijskih tvari.

ES: Scenario izloženosti

GefStoffVO: Propis o opasnim tvarima, Njemačka.

GHS: Globalno harmonizirani sustav razvrstavanja i označavanja kemikalija

IARC: Međunarodna agencija za istraživanja o karcinomu

IATA: Međunarodna udruga za zračni prijevoz.

IATA-DGR: Uredba o opasnim tvarima prema Međunarodnoj udruzi za zračni prijevoz (IATA).

IC50: Pulu maksimalna koncentracija inhibitora

ICAO: Organizacija međunarodnog civilnog zrakoplovstva.

ICAO-TI: Tehničke upute prema Organizaciji međunarodnog civilnog zrakoplovstva (ICAO).

IMDG: Međunarodni pomorski kodeks opasnog tereta.

INCI: Međunarodna nomenklatura kozmetičkih sastojaka.

IRCCS: Scientific Institute for Research, Hospitalization and Health Care

KAFH: KAFH

KSt: Koeficijent eksplozije.

LC50: Smrtna koncentracija u 50% slučajeva ispitivane populacije.

LD50: Smrtna doza u 50% slučajeva ispitivane populacije.

LDLo: Niska smrtonosna doza

N.A.: Nije primjenjivo

N/A: Nije primjenjivo

N/D: Nije definirano/ Nije primjenjivo

NA: Nije dostupan

NIOSH: Državni institut za zaštitu na radu

NOAEL: Razina bez uočenih štetnih učinaka

OSHA: Upravljanje zaštitom na radu

PBT: Persistentno, bioakumulativno i toksično

PGK: Packaging Instruction

PNEC: Predviđena koncentracija bez učinka.

PSG: Putnici

RID: Propis o međunarodnom prijevozu opasnih tvari željeznicom

STEL: Granica kratkotrajne izloženosti.

STOT: Toksičnost za ciljani organ.
TLV: Granična vrijednost praga.
TWATLV: Granična vrijednost praga za vremenski ponderirani prosjek. (ACGIH standard)
vPvB: Vrlo persistentno, vrlo bioakumulativno
WGK: Njemačka klasifikacija opasnosti za vodu.

Odlomci promijenjeni u odnosu na prethodnu reviziju:

- 2. OPIS rizika
- 3. SASTAV/INFORMACIJE O SASTOJCIMA
- 8. KONTROLA IZLAGANJA/OSOBNA ZAŠTITA
- 9. FIZIČKA I KEMIJSKA SVOJSTVA
- 11. TOKSIKOLOŠKI PODACI
- 12. EKOLOŠKI PODACI
- 15. INFORMACIJE O PROPISIMA

Annex – Exposure Scenario

Diphenylmethane-diisocyanate

ES6: Use at industrial sites

6.1. Title section

Exposure Scenario name	:	Adhesives, sealants
Structured Short Title	:	Use at industrial sites

Worker		
CS1	**Use in closed process, no likelihood of exposure** [MDI]	PROC1
CS2	**Use in closed, continuous process with occasional controlled exposure** [MDI]	PROC2
CS3	**Use in closed batch process (synthesis or formulation)** [MDI]	PROC3
CS4	**Use in batch and other process (synthesis) where opportunity for exposure arises** [MDI]	PROC4
CS5	**Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)** [MDI]	PROC5
CS6	**Industrial spraying** [MDI]	PROC7
CS7	**Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities** [MDI]	PROC8a
CS8	**Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities** [MDI]	PROC8b
CS9	**Transfer of substance or preparation into small containers (dedicated filling line, including weighing)** [MDI]	PROC9
CS10	**Roller application or brushing, Treatment of articles by dipping and pouring** [MDI]	PROC10, PROC13
CS11	**Production of preparations or articles by tabletting, compression, extrusion, pelletisation** [MDI]	PROC14
CS12	**Use as laboratory reagent** [MDI]	PROC15
CS13	**Low energy manipulation of substances bound in materials and/ or articles** [MDI]	PROC21

6.2. Conditions of use affecting exposure

6.2.1. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1) [MDI]

Product (article) characteristics

Concentration of the Substance in Mixture/Article	:	<= 100%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
Handle substance within a closed system.		
Conditions and measures related to personal protection, hygiene and health evaluation		
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.		
Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 1, PROC 3, PROC 15	:	240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9, PROC 13, PROC 14	:	480 cm² (palms of both hands)
PROC 7	:	1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor

Temperature	:	23 °C

6.2.2. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
Conditions and measures related to personal protection, hygiene and health evaluation		
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.		
Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 1, PROC 3, PROC 15	:	240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9,	:	480 cm² (palms of both hands)

PROC 13, PROC 14		
PROC 7	:	1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor
Temperature	:	23 °C

6.2.3. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3) [MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 100%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
Conditions and measures related to personal protection, hygiene and health evaluation		
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.		

Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 1, PROC 3, PROC 15	:	240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9, PROC 13, PROC 14	:	480 cm² (palms of both hands)
PROC 7	:	1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor
Temperature	:	23 °C

6.2.4. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4) [MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
Local exhaust ventilation is required. Provide extract ventilation to points where emissions occur. Provide extract ventilation to material transfer points and other openings.		
Conditions and measures related to personal protection, hygiene and health evaluation		
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection.		

Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.

Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 1, PROC 3, PROC 15	:	240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9, PROC 13, PROC 14	:	480 cm² (palms of both hands)
PROC 7	:	1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor
Temperature	:	50 °C

6.2.5. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Duration of the acitivity	:	1 hours/day
Frequency of use	:	5 days/week

Technical and organisational conditions and measures
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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.

Ensure control measures are regularly inspected and maintained. Local exhaust ventilation is required. Provide extract ventilation to points where emissions occur. Provide extract ventilation to material transfer points and other openings.
Conditions and measures related to personal protection, hygiene and health evaluation
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.

Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 1, PROC 3, PROC 15	:	240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9, PROC 13, PROC 14	:	480 cm² (palms of both hands)
PROC 7	:	1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor
Temperature	:	23 °C

6.2.6. Control of worker exposure: Industrial spraying (PROC7) [MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		

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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.
Ensure control measures are regularly inspected and maintained. Local exhaust ventilation is required. Handle substance within a predominantly closed system provided with extract ventilation. Provide extract ventilation to points where emissions occur. Provide extract ventilation to material transfer points and other openings.
Conditions and measures related to personal protection, hygiene and health evaluation
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.
Other conditions affecting workers exposure
Exposed skin area :
PROC 1, PROC 3, PROC 15 : 240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9, PROC 13, PROC 14 : 480 cm² (palms of both hands)
PROC 7 : 1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10 : 960 cm² (both hands)
PROC 21 : 1980 cm² (both hands and forearms)
Indoor or outdoor use : Indoor
Temperature : 23 °C

6.2.7. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%

Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Duration of the acitivity	:	1 hours/day
Remarks	:	daily or less, Short term
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
Conditions and measures related to personal protection, hygiene and health evaluation		
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.		
Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 1, PROC 3, PROC 15	:	240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9, PROC 13, PROC 14	:	480 cm² (palms of both hands)
PROC 7	:	1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor
Temperature	:	23 °C

6.2.8. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Duration of the acitivity	:	1 hours/day
Remarks	:	daily or less, Short term
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
Handle substance within a closed system.		
Conditions and measures related to personal protection, hygiene and health evaluation		
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.		
Other conditions affecting workers exposure		
Exposed skin area	:	

PROC 1, PROC 3, PROC 15	:	240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9, PROC 13, PROC 14	:	480 cm² (palms of both hands)
PROC 7	:	1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor
Temperature	:	23 °C

6.2.9. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
Ensure control measures are regularly inspected and maintained. Local exhaust ventilation is required. Provide extract ventilation to points where emissions occur. Provide extract ventilation to material transfer points and other openings.		
Conditions and measures related to personal protection, hygiene and health evaluation		
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents		

BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.		
Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 1, PROC 3, PROC 15	:	240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9, PROC 13, PROC 14	:	480 cm² (palms of both hands)
PROC 7	:	1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor
Temperature	:	23 °C

6.2.10. Control of worker exposure: Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
Conditions and measures related to personal protection, hygiene and health evaluation		
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols.		

Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.

Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 1, PROC 3, PROC 15	:	240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9, PROC 13, PROC 14	:	480 cm² (palms of both hands)
PROC 7	:	1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor
Temperature	:	23 °C

6.2.11. Control of worker exposure: Production of preparations or articles by tabletting, compression, extrusion, pelletisation (PROC14)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week

Technical and organisational conditions and measures
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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents

BELOW 40°C: Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.

Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 1, PROC 3, PROC 15	:	240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9, PROC 13, PROC 14	:	480 cm² (palms of both hands)
PROC 7	:	1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor
Temperature	:	50 °C

6.2.12. Control of worker exposure: Use as laboratory reagent (PROC15) [MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 100%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
With Local exhaust ventilation (LEV) Local exhaust ventilation is required. Provide extract ventilation to points where emissions occur. OR Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation.		
Without Local exhaust ventilation (LEV) With respiratory protection Ensure the ventilation system is regularly maintained and tested.		
Conditions and measures related to personal protection, hygiene and health evaluation		
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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.		
Without Local exhaust ventilation (LEV) With respiratory protection Wear suitable respiratory protection.		
General advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.		
Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 1, PROC 3, PROC 15	:	240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9, PROC 13, PROC 14	:	480 cm² (palms of both hands)
PROC 7	:	1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor
Temperature	:	23 °C

6.2.13. Control of worker exposure: Low energy manipulation of substances bound in materials and/ or articles (PROC21)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 1%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	:, Solid, low dustiness
Physical form of product	:	:, Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
Conditions and measures related to personal protection, hygiene and health evaluation		
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.		
Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 1, PROC 3, PROC 15	:	240 cm² (palm of one hand)
PROC 2, PROC 4, PROC 5, PROC 9, PROC 13, PROC 14	:	480 cm² (palms of both hands)

PROC 7	:	1500 cm² (both hands and forearms)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor
Temperature	:	23 °C

6.3. Exposure estimation and reference to its source

6.3.1. Worker exposure: Use in closed process, no likelihood of exposure (PROC1) [MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.00092 mg/m³ (EasyTRA, v4.1)	0.0184	General ventilation: 30%, Closed system, Efficiency: 90%
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

6.3.2. Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2) [MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.00921 mg/m³ (EasyTRA, v4.1)	0.1842	General ventilation: 30%
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

6.3.3. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3) [MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.00921 mg/m³ (EasyTRA, v4.1)	0.1842	General ventilation: 30%
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

6.3.4. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.0006 mg/m³ (EasyTRA, v4.1)	0.012	General ventilation: 30%, LEV: 90% efficiency, Respirator: 90% protection
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

6.3.5. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) [MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.00011 mg/m³ (EasyTRA, v4.1)	0.0022	General ventilation: 30%, LEV: 90% efficiency
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

6.3.6. Worker exposure: Industrial spraying (PROC7) [MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.01022 mg/m³ (EasyTRA, v4.1)	0.2044	General ventilation: 30%, LEV: 95% efficiency
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

6.3.7. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.0036 mg/m³ (EasyTRA, v4.1)	0.072	General ventilation: 30%
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

* Qualitative approach used to conclude safe use.

6.3.8. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.00364 mg/m³ (EasyTRA, v4.1)	0.0728	General ventilation: 30%, Closed system, 99% efficiency
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

6.3.9. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.004766 mg/m³ (EasyTRA, v4.1)	0.095324	General ventilation: 30%, LEV: 90% efficiency
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

6.3.10. Worker exposure: Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13)
[MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.017 mg/m³ (EasyTRA, v4.1)	0.340	General ventilation: 30%
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

6.3.11. Worker exposure: Production of preparations or articles by tabletting, compression, extrusion, pelletisation (PROC14)
[MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.00576 mg/m³ (EasyTRA, v4.1)	0.1152	General ventilation: 30%

Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

6.3.12. Worker exposure: Use as laboratory reagent (PROC15) [MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.00558 mg/m³ (EasyTRA, v4.1)	0.1116	General ventilation: 30%, LEV: 90% efficiency, OR, Respirator: 90% protection
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

6.3.13. Worker exposure: Low energy manipulation of substances bound in materials and/ or articles (PROC21)
[MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.00921 mg/m³ (EasyTRA, v4.1)	0.1842	General ventilation: 30%
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

6.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The risk management measures given in this exposure scenario apply to the specified substance in a concentration as indicated in the scenario. The concentration of the substance in the product may differ. A downstream user should evaluate if the risk management measures may be adapted accordingly.
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.
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 assumptions contained in this Exposure Scenario can be found at: www.ISOPA.org

ES16: Widespread use by professional workers

16.1. Title section

Exposure Scenario name	:	Adhesives, sealants
Structured Short Title	:	Widespread use by professional workers

Worker		
CS1	**Use in batch and other process (synthesis) where opportunity for exposure arises** [MDI]	PROC4
CS2	**Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)** [MDI]	PROC5
CS3	**Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities** [MDI]	PROC8a
CS4	**Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities** [MDI]	PROC8b
CS5	**Roller application or brushing, Treatment of articles by dipping and pouring** [MDI]	PROC10, PROC13
CS6	**Non industrial spraying** [MDI]	PROC11
CS7	**Low energy manipulation of substances bound in materials and/ or articles** [MDI]	PROC21

16.2. Conditions of use affecting exposure

16.2.1. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
Outdoor use		

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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.
With Local exhaust ventilation (LEV) Local exhaust ventilation is required. Provide extract ventilation to points where emissions occur. Provide extract ventilation to material transfer points and other openings.
Conditions and measures related to personal protection, hygiene and health evaluation
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.

Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 4, PROC 5, PROC 13	:	480 cm² (palms of both hands)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 11	:	1500 cm² (both hands and forearms)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor use
Temperature	:	50 °C

16.2.2. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C

Physical form of product	:	Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Duration of the acitivity	:	1 hours/day
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
Outdoor use 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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
Indoor use With Local exhaust ventilation (LEV) Ensure control measures are regularly inspected and maintained. Local exhaust ventilation is required. Provide extract ventilation to points where emissions occur. Provide extract ventilation to material transfer points and other openings.		
Indoor use Without Local exhaust ventilation (LEV) OR Outdoor use Ensure control measures are regularly inspected and maintained.		
Conditions and measures related to personal protection, hygiene and health evaluation		
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 exhaust ventilation (LEV) OR Outdoor use Wear a respirator conforming to EN140.		
General advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.		
Other conditions affecting workers exposure		

Exposed skin area	:	
PROC 4, PROC 5, PROC 13	:	480 cm² (palms of both hands)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 11	:	1500 cm² (both hands and forearms)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor/Outdoor use
Temperature	:	23 °C

16.2.3. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Duration of the acitivity	:	1 hours/day
Remarks	:	daily or less, ,, Short term
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
Outdoor use 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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
Conditions and measures related to personal protection, hygiene and health evaluation		
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C:		

Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.		
Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 4, PROC 5, PROC 13	:	480 cm² (palms of both hands)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 11	:	1500 cm² (both hands and forearms)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor use
Temperature	:	23 °C

16.2.4. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Duration of the acitivity	:	1 hours/day
Remarks	:	daily or less, ,, Short term
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
Outdoor use 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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.		
Handle substance within a closed system.		
Conditions and measures related to personal protection, hygiene and health evaluation		

These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.

Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 4, PROC 5, PROC 13	:	480 cm² (palms of both hands)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 11	:	1500 cm² (both hands and forearms)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor use
Temperature	:	23 °C

16.2.5. Control of worker exposure: Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week

Technical and organisational conditions and measures
Outdoor use 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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric

substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.

Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 4, PROC 5, PROC 13	:	480 cm² (palms of both hands)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 11	:	1500 cm² (both hands and forearms)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor use
Temperature	:	23 °C

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

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 60%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Duration of the acitivity	:	6 hours/day
Remarks	:	1, -, 5
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		

Outdoor use 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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Ensure control measures are regularly inspected and maintained.
Indoor use 1 Ensure control measures are regularly inspected and maintained. Local exhaust ventilation is required. Handle substance within a predominantly closed system provided with extract ventilation. Provide extract ventilation to points where emissions occur. Provide extract ventilation to material transfer points and other openings.
Indoor use 2 Access to work area only for authorized persons. Ensure control measures are regularly inspected and maintained. Local exhaust ventilation is required. Ensure that a spraying booth is used.
Indoor use 3 Access to work area only for authorized persons. Ensure control measures are regularly inspected and maintained. Open doors and windows.
Indoor use 4 Access to work area only for authorized persons. Ensure control measures are regularly inspected and maintained. Local exhaust ventilation is required. Provide extract ventilation to points where emissions occur.
Outdoor use 5 Access to work area only for authorized persons. Ensure control measures are regularly inspected and maintained. Ensure operation is undertaken outdoors. Stay upwind/keep distance from source.
Conditions and measures related to personal protection, hygiene and health evaluation
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 2 Wear a full face respirator conforming to EN136.

Indoor use 3 Wear a full face respirator conforming to EN136.		
Indoor use 4 Wear a full face respirator conforming to EN136.		
Outdoor use 5 Wear a full face respirator conforming to EN136.		
General advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.		
Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 4, PROC 5, PROC 13	:	480 cm² (palms of both hands)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 11	:	1500 cm² (both hands and forearms)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor/Outdoor use
Temperature	:	35 °C
Remarks	:	1, -, 5

16.2.7. Control of worker exposure: Low energy manipulation of substances bound in materials and/ or articles (PROC21)
[MDI]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	:	<= 1%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Physical form of product	:	Solid, low dustiness
Physical form of product	:	Low volatile liquid
Amount used, frequency and duration of use (or from service life)		
General exposures	:	8 hours/day
Frequency of use	:	5 days/week
Technical and organisational conditions and measures		
Outdoor use 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 cupboard or under extract ventilation. These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Clear spills immediately. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents		

BELOW 40°C: Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
These measures are for all contributing scenarios at product temperature BELOW 40°C for MDI monomeric substances and BELOW 45°C for other MDI based substances or without spraying: Do not inhale vapours / aerosols. Ensure 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 suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. The use of latex gloves is not supported. These measures are for all contributing scenarios at product temperature ABOVE 40°C for MDI monomeric substances and ABOVE 45°C for other MDI based substances or with spraying and use of aprotic polar solvents BELOW 40°C: Wear a full face respirator conforming to 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 advice Irrespective of the stated risk management measures respiratory protection is generally recommended for spraying applications.

Other conditions affecting workers exposure		
Exposed skin area	:	
PROC 4, PROC 5, PROC 13	:	480 cm² (palms of both hands)
PROC 8a, PROC 8b, PROC 10	:	960 cm² (both hands)
PROC 11	:	1500 cm² (both hands and forearms)
PROC 21	:	1980 cm² (both hands and forearms)
Indoor or outdoor use	:	Indoor use
Temperature	:	23 °C

16.3. Exposure estimation and reference to its source

16.3.1. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.0006 mg/m³ (EasyTRA, v4.1)	0.012	General ventilation: 30%, LEV: 90% efficiency, OR, Respirator: 90% protection
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

16.3.2. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) [MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.00011 mg/m³ (EasyTRA, v4.1)	0.0022	Indoor use, General ventilation: 30%, LEV: 90% efficiency, OR, Respirator: 90% protection
long term, inhalative, local,	0.00011 mg/m³ (EasyTRA, v4.1)	0.0022	Outdoor use, Outdoor use: 30%, Respirator: 90% protection
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

16.3.3. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.0036 mg/m³ (EasyTRA, v4.1)	0.072	General ventilation: 30%
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

16.3.4. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.00364 mg/m³ (EasyTRA, v4.1)	0.0728	General ventilation: 30%, Closed system, 99% efficiency
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

16.3.5. Worker exposure: Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13)
[MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.017 mg/m³ (EasyTRA, v4.1)	0.340	General ventilation: 30%
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

16.3.6. Worker exposure: Non industrial spraying (PROC11) [MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.012 mg/m³ (EasyTRA, v4.1)	0.240	Indoor use, 1, General ventilation: 30%, LEV: 99% efficiency
long term, inhalative, local,	0.003 mg/m³ (EasyTRA, v4.1)	0.060	Indoor use, 2, General ventilation: 30%, LEV: 90% efficiency, Respirator: 97.5% protection
long term, inhalative, local,	0.022 mg/m³ (EasyTRA, v4.1)	0.440	Indoor use, 3, General ventilation: 30%, Respirator: 97.5% protection
long term, inhalative, local,	0.003 mg/m³ (EasyTRA, v4.1)	0.060	Indoor use, 4, General ventilation: 30%, LEV: 90% efficiency, Respirator: 97.5% protection
long term, inhalative, local,	0.022 mg/m³ (EasyTRA, v4.1)	0.440	Outdoor use, 5, Outdoors: 30% reduction, Respirator: 97.5% protection
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

16.3.7. Worker exposure: Low energy manipulation of substances bound in materials and/ or articles (PROC21)
[MDI]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, local,	0.00921 mg/m³ (EasyTRA, v4.1)	0.1842	General ventilation: 30%
Dermal exposure,	* (Qualitative assessment)	< 1	Gloves: 90% protection

Additional information on exposure estimation
Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).
* Qualitative approach used to conclude safe use.

16.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The risk management measures given in this exposure scenario apply to the specified substance in a concentration as indicated in the scenario. The concentration of the substance in the product may differ. A downstream user should evaluate if the risk management measures may be adapted accordingly.
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.
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 assumptions contained in this Exposure Scenario can be found at: www.ISOPA.org

ES22: Consumer use

22.1. Title section

Exposure Scenario name	:	Adhesives, sealants
Structured Short Title	:	Consumer use

Consumer		
CS1	**Adhesives, sealants** [MDI]	PC1

22.2. Conditions of use affecting exposure

22.2.1. Control of consumer exposure: Adhesives, sealants (PC1) [MDI]

Product (article) characteristics		
1 Component Bottled Construction Glue - Applying	:	20%
1 Component Bottled Universal Wood Glue - Applying	:	20%
2 Component Adhesives - Applying	:	30%
2 Component Adhesives - Mixing	:	30%
2 Component Joint Sealant - Mixing	:	45%
2 Component Joint Sealant - Applying	:	45%
2 Component Parquet Glue - Mixing	:	50%
2 Component Parquet Glue - Applying	:	50%
1 Component Assembly Sealant - Applying	:	20%
Molar Mass	:	250 g/mol
Vapour pressure	:	0.001 Pa at 20 °C
Amount used, frequency and duration of use (or from service life)		
1 Component Bottled Construction Glue - Applying	:	250 g
1 Component Bottled Universal Wood Glue - Applying	:	10 g
2 Component Adhesives - Mixing	:	20 g
2 Component Adhesives - Applying	:	20 g
2 Component Joint Sealant - Mixing	:	160 g
2 Component Joint Sealant - Applying	:	160 g
2 Component Parquet Glue - Mixing	:	7000 g
2 Component Parquet Glue - Applying	:	22000 g
1 Component Assembly Sealant - Applying	:	390 g

Duration	:	1 Component Bottled Construction Glue - Applying
Duration	:	Exposure duration 240 min
Duration	:	Application duration 30 min
Duration	:	
Duration	:	1 Component Bottled Universal Wood Glue - Applying
Duration	:	Exposure duration 240 min
Duration	:	Application duration 20 min
Duration	:	
Duration	:	2 Component Adhesives - Mixing
Duration	:	Exposure duration 5 min
Duration	:	Application duration 5 min
Duration	:	
Duration	:	2 Component Adhesives - Applying
Duration	:	Exposure duration 240 min
Duration	:	Application duration 30 min
Duration	:	
Duration	:	2 Component Joint Sealant - Mixing
Duration	:	Exposure duration 5 min
Duration	:	Application duration 5 min
Duration	:	
Duration	:	2 Component Joint Sealant - Applying
Duration	:	Exposure duration 15 min
Duration	:	Application duration 15 min
Duration	:	
Duration	:	2 Component Parquet Glue - Mixing
Duration	:	Exposure duration 10 min

Duration	:	Application duration 10 min
Duration	:	
Duration	:	2 Component Parquet Glue - Applying
Duration	:	Exposure duration 480 min
Duration	:	Application duration 480 min
Duration	:	
Duration	:	1 Component Assembly Sealant - Applying
Duration	:	Exposure duration 240 min
Duration	:	Application duration 30 min
Conditions and measures related to personal protection, hygiene and health evaluation		
Remarks	:	No spraying
Other conditions affecting consumers exposure		
Indoor or outdoor use	:	PC1
Indoor or outdoor use	:	1 Component Bottled Construction Glue - Applying
Room size	:	20 m³
Temperature	:	20 °C
Ventilation rate	:	0.6
Indoor or outdoor use	:	
Indoor or outdoor use	:	1 Component Bottled Universal Wood Glue - Applying
Room size	:	20 m³
Temperature	:	20 °C
Ventilation rate	:	0.6
Indoor or outdoor use	:	
Indoor or outdoor use	:	2 Component Adhesives - Mixing
Room size	:	20 m³
Temperature	:	20 °C
Ventilation rate	:	0.6
Indoor or outdoor use	:	
Indoor or outdoor use	:	2 Component Adhesives - Applying
Room size	:	20 m³
Temperature	:	20 °C
Ventilation rate	:	0.6
Indoor or outdoor use	:	
Indoor or outdoor use	:	2 Component Joint Sealant - Mixing
Room size	:	1 m³

Temperature	:	20 °C
Ventilation rate	:	0.6
Indoor or outdoor use	:	
Indoor or outdoor use	:	2 Component Joint Sealant - Applying
Room size	:	20 m³
Temperature	:	20 °C
Ventilation rate	:	0.6
Indoor or outdoor use	:	
Indoor or outdoor use	:	2 Component Parquet Glue - Mixing
Room size	:	1 m³
Temperature	:	20 °C
Ventilation rate	:	0.6
Indoor or outdoor use	:	
Indoor or outdoor use	:	2 Component Parquet Glue - Applying
Room size	:	58 m³
Temperature	:	20 °C
Ventilation rate	:	0.5
Indoor or outdoor use	:	
Indoor or outdoor use	:	1 Component Assembly Sealant - Applying
Room size	:	20 m³
Temperature	:	20 °C
Ventilation rate	:	0.6
Release area 10,000 cm²1 Component Bottled Construction Glue - Applying		
Release area 400 cm²1 Component Bottled Universal Wood Glue - Applying		
Release area 20 cm²2 Component Adhesives - Mixing		
Release area 20 cm²2 Component Adhesives - Applying		
Release area 20 cm²2 Component Joint Sealant - Mixing		
Release area 10 cm²2 Component Joint Sealant - Applying		
Release area 320 cm²2 Component Parquet Glue - Mixing		
Release area 10,000 cm²2 Component Parquet Glue - Applying		
Release area 15,000 cm²1 Component Assembly Sealant - Applying		
Mass transfer rate 0.192 m/minPC1		
Mol weight matrix 3,000 g/molPC1		

22.3. Exposure estimation and reference to its source

22.3.1. Consumer exposure: Adhesives, sealants (PC1) [MDI]

Value type	Exposure level	RCR	Remarks
short term, inhalative, systemic,	0.017921 mg/m³ (ConsExpo)	0.358417	Adhesives, sealants, 1 Component Bottled Construction Glue - Applying

	0.001404 mg/kg bw/day (ConsExpo)	0.358417	Adhesives, sealants, 1 Component Bottled Construction Glue - Applying
short term, inhalative, systemic,	0.001133 mg/m³ (ConsExpo)	0.022661	Adhesives, sealants, 1 Component Bottled Universal Wood Glue - Applying
	0.000089 mg/kg bw/day (ConsExpo)	0.022661	Adhesives, sealants, 1 Component Bottled Universal Wood Glue - Applying
short term, inhalative, systemic,	0.0000027 mg/m³ (ConsExpo)	0.000054	Adhesives, sealants, 2 Component Adhesives - Mixing
	0.0000000044 mg/kg bw/day (ConsExpo)	0.000054	Adhesives, sealants, 2 Component Adhesives - Mixing
short term, inhalative, systemic,	0.000063 mg/m³ (ConsExpo)	0.00125	Adhesives, sealants, 2 Component Adhesives - Applying
	0.0000049 mg/kg bw/day (ConsExpo)	0.00125	Adhesives, sealants, 2 Component Adhesives - Applying
short term, inhalative, systemic,	0.000058 mg/m³ (ConsExpo)	0.001168	Adhesives, sealants, 2 Component Joint Sealant - Mixing
	0.0000000953 mg/kg bw/day (ConsExpo)	0.001168	Adhesives, sealants, 2 Component Joint Sealant - Mixing
short term, inhalative, systemic,	0.00000144 mg/m³ (ConsExpo)	0.000029	Adhesives, sealants, 2 Component Joint Sealant - Applying
	0.0000000071 mg/kg bw/day (ConsExpo)	0.000029	Adhesives, sealants, 2 Component Joint Sealant - Applying
short term, inhalative, systemic,	0.001841 mg/m³ (ConsExpo)	0.036816	Adhesives, sealants, 2 Component Parquet Glue - Mixing
	0.00000601 mg/kg bw/day (ConsExpo)	0.036816	Adhesives, sealants, 2 Component Parquet Glue - Mixing
short term, inhalative, systemic,	0.014584 mg/m³ (ConsExpo)	0.291686	Adhesives, sealants, 2 Component Parquet Glue - Applying
	0.002285 mg/kg bw/day (ConsExpo)	0.291686	Adhesives, sealants, 2 Component Parquet Glue - Applying
short term, inhalative, systemic,	0.022601 mg/m³ (ConsExpo)	0.452016	Adhesives, sealants, 1 Component Assembly Sealant - Applying
	0.00177 mg/kg bw/day (ConsExpo)	0.452016	Adhesives, sealants, 1 Component Assembly Sealant - Applying

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

22.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The risk management measures given in this exposure scenario apply to the specified substance in a concentration as indicated in the scenario. The concentration of the substance in the product may differ. A downstream user should evaluate if the risk management measures may be adapted accordingly.
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.
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 assumptions contained in this Exposure Scenario can be found at: www.ISOPA.org