



Vattenfri ammoniak innehåller mindre än 0,5 % vatten

Säkerhetsdatablad

enligt REACH-förordningen (EG) 1907/2006 ändrad genom förordning (EU) 2020/878
SDS-id: OC00040
Publiceringsdatum: 2025-07-31 Version: 1.0

AVSNITT 1: Namnet på ämnet/blandningen och bolaget/företaget

1.1. Produktbeteckning

Produktens form : Ämne
Namn : Vattenfri ammoniak
innehåller mindre än 0,5 % vatten
Handelsnamn : Anhydrous Ammonia
Anhydrous Ammonia Novo
EC nr : 231-635-3
CAS nr : 7664-41-7
REACH Registernr. : 01-2119488876-14-0249

1.2. Relevanta identifierade användningar av ämnet eller blandningen och användningar som det avråds från

1.2.1. Relevanta identifierade användningar

Kategori efter huvudsaklig användning : Tillverkning, Formulering, Intermediär, Industriell användning, Professionellt bruk

1.2.2. Användningar som det avråds från

Ingen ytterligare information tillgänglig

1.3. Närmare upplysningar om den som tillhandahåller säkerhetsdatabladet

OCI Ammonia Distribution B.V.
Wolgaweg 31
3198 LR Europoort Rotterdam
The Netherlands
info.oad@oci-global.com, www.oci-global.com

1.4. Telefonnummer för nödsituationer

Telefonnummer för nödsituationer : Alert & Care Centre Chemelot (Geleen, The Netherlands): +31 (0) 46 4765555 (24/7)

Land/område	Organisation/Firma	Adress	Telefonnummer för nödsituationer	Kommentar
Sverige	Giftinformationscentralen	Solna Strandväg 21 171 54 Solna	112 – begär Giftinformation	

AVSNITT 2: Farliga egenskaper

2.1. Klassificering av ämnet eller blandningen

Klassificering enligt förordning (EG) 1272/2008 [CLP]

Brandfarliga gaser, kategori 2 H221
Gaser under tryck : Komprimerad gas H280
Akut inhalationstoxicitet, kategori 3 H331
Frätande eller irriterande på huden, kategori 1, underkategori 1B H314
Farligt för vattenmiljön – akut fara, kategori: akut 1 H400
Farligt för vattenmiljön – fara för skadliga långtidseffekter, kategori: kronisk 2 H411
H- och EUH-angivelsernas kompletta ordalydelse, se avsnitt 16:

Skadliga fysikalisk-kemiska effekter och hälso- och miljöeffekter

Innehåller gas under tryck. Kan explodera vid uppvärmning. Brandfarlig gas. Giftigt vid inandning. Orsakar allvarliga frätskador på hud och ögon. Orsakar allvarliga ögonskador. Mycket giftigt för vattenlevande organismer. Giftigt för vattenlevande organismer med långtidseffekter.

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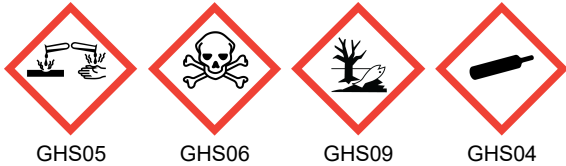
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2.2. Märkningsuppgifter

Känneteckning enligt förordning (EG) Nr. 1272/2008 [CLP]

Faropiktogram (CLP)



Signalord (CLP)

: Fara

Faroangivelser (CLP)

- : H221 - Brandfarlig gas.
H280 - Innehåller gas under tryck. Kan explodera vid uppvärmning.
H314 - Orsakar allvarliga frätskador på hud och ögon.
H331 - Giftigt vid inandning.
H410 - Mycket giftigt för vattenlevande organismer med långtidseffekter.
- : P210 - Får inte utsättas för värme, heta ytor, gnistor, öppen låga eller andra antändningskällor. Rökning förbjuden.
P280 - Använd skyddshandskar/skyddskläder/ögonskydd/ansiktsskydd.
P303+P361+P353+P310 - VID HUDKONTAKT (även håret): Ta omedelbart av alla nedstänkta kläder. Skölj huden med vatten/duscha. Kontakta genast läkare.
P304+P340+P311 - VID INANDNING: Flytta personen till frisk luft och se till att andningen underlättas. Kontakta GIFTINFORMATIONSCENTRAL eller läkare.
P305+P351+P338+P310 - VID KONTAKT MED ÖGONEN: Skölj försiktigt med vatten i flera minuter. Ta ur eventuella kontaktlinser om det går lätt. Fortsätt att skölja. Kontakta genast GIFTINFORMATIONSCENTRAL eller läkare.
P403 - Förvaras på väl ventilerad plats.
- : EUH071 - Frätande på luftvägarna.
: Valfria åtgärder : Diphoterine®.

EUH-fraser

Extra fraser

2.3. Andra faror

Andra faror som inte bidrar till klassificeringen : Kontakt med produkten kan orsaka frostsador.

Detta ämne/blandning uppfyller inte PBT-kriterierna i REACH-förordningen, bilaga XIII
Detta ämne/blandning uppfyller inte vPvB-kriterierna i REACH-förordningen, bilaga XIII
Innehåller inga PBT- och/eller vPvB-ämnen $\geq 0,1\%$ utvärderade i enlighet med REACH bilaga XIII

Ämnet ingår inte i listan som upprättats i enlighet med artikel 59.1 i REACH för att ha hormonstörande egenskaper eller identifieras inte som hormonstörande egenskaper i enlighet med kriterierna i Kommissionens delegerade förordning (EU) 2017 / 2100 eller Kommissionens förordning (EU) 2018/605

AVSNITT 3: Sammansättning/information om beståndsdelar

3.1. Ämnen

Namn	Produktbeteckning	Konc. (% andel i vikt)	Klassificering enligt förordning (EG) 1272/2008 [CLP]
Ammonia, anhydrous	CAS nr: 7664-41-7 EC nr: 231-635-3 Index nr: 007-001-00-5 REACH-nr: 01-2119488876-14-0249	$\geq 99,5 - \leq 100$	Flam. Gas 2, H221 Press. Gas Acute Tox. 3 (Inhalation), H331 Skin Corr. 1B, H314 Aquatic Acute 1, H400 Aquatic Chronic 2, H411

H- och EUH-angivelsernas kompletta ordalydelse, se avsnitt 16:

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AVSNITT 4: Åtgärder vid första hjälpen

4.1. Beskrivning av åtgärder vid första hjälpen

Första hjälpen allmän	: Kontakta läkare omedelbart. Ge första hjälpen beroende på vilken typ av skada det är. Stora kvantiteter: Skölj med rikliga mängder vatten. Spola med Diphotherine®. Små mängder: Spola med Diphotherine®. Ge hjärt-lungräddning (HLR) om andningen har upphört eller hjärtat har slutat slå. Det kan vara farligt att ge konstgjord andning.
Första hjälpen efter inandning	: Kontakta läkare omedelbart. Flytta personen till frisk luft och se till att andningen underlättas.
Första hjälpen efter hudkontakt	: Kontakta läkare omedelbart. Stora kvantiteter: Skölj huden med vatten/duscha. Spola kläderna med rikligt med vatten. Spola med Diphotherine®. Små mängder: Spola med Diphotherine®. Vid kontakt med flytande gas, tina frusna kroppsdelar med ljummet vatten. Ta omedelbart av alla nedstänkta kläder.
Första hjälpen efter kontakt med ögonen	: Kontakta läkare omedelbart. Spola med Diphotherine®. Ta bort kontaktlinser.
Första hjälpen efter förtäring	: Kontakta läkare omedelbart. Skölj munnen. Framkalla INTE kräkning.

4.2. De viktigaste symptomen och effekterna, både akuta och fördröjda

Symptom/effekter	: Kan orsaka frostsador.
Symptom/effekter efter inandning	: Kan orsaka irritation i luftvägarna. Hosta, nysningar. Andningssvårigheter.
Symptom/effekter efter hudkontakt	: Brännskador.
Symptom/effekter efter kontakt med ögonen	: Allvarliga ögonskador.
Symptom/effekter efter förtäring	: Brännskador.

4.3. Angivande av omedelbar medicinsk behandling och särskild behandling som eventuellt krävs

Behandla symptomatiskt. Symptomen kan vara fördröjda.

AVSNITT 5: Brandbekämpningsåtgärder

5.1. Släckmedel

Lämpliga släckmedel	: Vattenspray. Torrt pulver. Skum. Koldioxid.
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5.2. Särskilda faror som ämnet eller blandningen kan medföra

Brandrisk	: Brandfarlig gas. Innehåller gas under tryck. Kan explodera vid uppvärmning.
Farliga sönderdelningsprodukter	: Risk för utveckling av giftig rök. Kväveoxider. Väte. Amin.

5.3. Råd till brandbekämpningspersonal

Släckinstruktioner	: Använd vattenspray eller dimma för att kyla ned exponerade behållare. Avlägsna alla antändningskällor om det kan göras på ett säkert sätt. Läckande gas som brinner: Försök inte släcka branden om inte läckan kan stoppas på ett säkert sätt. Låt inte (överblivet) släckvatten komma ut i omgivningen. Bekämpa ångorna som avges med vaporiserat vatten.
Skydd under brandbekämpning	: Försök inte vidta åtgärder utan lämplig skyddsutrustning. Självförsörjande andningsapparat (SCBA). Heltäckande skyddskläder.

AVSNITT 6: Åtgärder vid oavsiktliga utsläpp

6.1. Personliga skyddsåtgärder, skyddsutrustning och åtgärder vid nödsituationer

6.1.1. För annan personal än räddningspersonal

Planeringar för nödfall	: Evakuera överflödig personal. Ventilera spillområdet. Inga öppna lågor, inga gnistor, ingen rökning. Undvik kontakt med ögon och hud. Inandas inte ångor, dimma, sprej. Använd personlig skyddsutrustning. Stå i riktning mot vinden och på avstånd från källan.
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6.1.2. För räddningspersonal

Skyddsutrustning	: Försök inte vidta åtgärder utan lämplig skyddsutrustning. För mer information, se avsnitt 8: "Begränsning av exponering/personligt skydd".
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6.2. Miljöskyddsåtgärder

Undvik utsläpp till miljön. Meddela myndigheter om produkt kommer ut i avloppssystem och offentliga vatten.

6.3. Metoder och material för inneslutning och sanering

För inneslutning	: Samla upp spill. Stoppa läckan, utan onödig risktagning om möjligt.
Rengöringsmetoder	: Ventilera området ordentligt. Avlägsna alla källor till antändning. Absorbera utspilld vätska med absorptionsmedel t.ex.: sand. Sopa eller skyffla bort, samla upp i behållare för deponi.
Annan information	: Lämna material och fasta rester till en auktoriserad anläggning.

6.4. Hänvisning till andra avsnitt

Se avsnitt 8 och 13.

AVSNITT 7: Hantering och lagring

7.1. Skyddsåtgärder för säker hantering

Skyddsåtgärder för säker hantering	: Hantera i enlighet med god industriell hygien och säkerhetsrutiner. Får inte utsättas för värme, heta ytor, gnistor, öppen låga eller andra antändningskällor. Rökning förbjuden. Avlägsna alla antändningskällor om det kan göras på ett säkert sätt. Används endast utomhus eller i väl ventilerade utrymmen. Undvik kontakt med ögon och hud. Inandas inte dimma, sprej, ångor. Använd personlig skyddsutrustning.
Åtgärder beträffande hygien	: Nedstänkta kläder ska tvättas innan de används igen. Ät inte, drick inte och rök inte när du använder produkten. Tvätta alltid händerna efter all hantering.

7.2. Förhållanden för säker lagring, inklusive eventuell oförenlighet

Lagringsvillkor	: Förvara i enlighet med lokala, regionala, nationella eller internationella bestämmelser. Behållaren ska vara väl tillsluten. Förvaras svalt. Förvara på ett torrt, välventilerat ställe bortom källor för värme och antändning samt direkt solljus.
Oförenliga material	: Se sektion 10 om inkompatibla material.
Lagringstemperatur	: < 25 °C

7.3. Specifik slutanvändning

Ingen ytterligare information tillgänglig

AVSNITT 8: Begränsning av exponeringen/personligt skydd

8.1. Kontrollparametrar

8.1.1 Nationella gränsvärden för exponering på arbetsplatsen och biologiska gränsvärden

Ammonia, anhydrous (7664-41-7)

EU - Indikativa yrkeshygieniska gränsvärden (IOEL)

Lokalt namn	Ammonia, anhydrous
IOELV TWA (mg/m ³)	14 mg/m ³
IOELV TWA (ppm)	20 ppm
IOELV STEL (mg/m ³)	36 mg/m ³
IOELV STEL (ppm)	50 ppm
Regleringsreferens	COMMISSION DIRECTIVE 2000/39/EC

Sverige - Yrkeshygieniska gränsvärden

Lokalt namn	Ammoniak
Nivågränsvärde (NVG) (mg/m ³)	14 mg/m ³

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Ammonia, anhydrous (7664-41-7)	
Nivågränsvärde (NVG) (ppm)	20 ppm
Kortidsvärde (KTV) (mg/m³)	36 mg/m³
Kortidsvärde (KTV) (ppm)	50 ppm
Anmärkning	2 (Kortidsgränsvärde som avser 5-minutersperiod gäller för ammoniak, diisocyanater, 2,6-diisopropylfenylisocyanat, fenylisocyanat, isocyansyra och metylisocyanat. Kortidsgränsvärde som avser 1-minuters-period gäller för akrylsyra)
Regleringsreferens	Hygieniska gränsvärden (AFS 2018:1)

8.1.2. Rekommenderade övervakningsförfaranden

Ingen ytterligare information tillgänglig

8.1.3. Det bildas luftföroreningar

Ingen ytterligare information tillgänglig

8.1.4. DNEL och PNEC

Vattenfri ammoniak innehåller mindre än 0,5 % vatten (7664-41-7)	
DNEL/DMEL (Arbetare)	
Akut - systemiska effekter, dermal	6,8 mg/kg kroppsvikt/dag
Akut - systemiska effekter, inandningen	47,6 mg/m³
Akut - lokala effekter, inandningen	36 mg/m³
Långvarigt - systemiska effekter, dermal	6,8 mg/kg kroppsvikt/dag
Långvarigt - systemiska effekter, inandningen	47,6 mg/m³
Långvarigt - lokala effekter, inandningen	14 mg/m³
PNEC (Vatten)	
PNEC aqua (sötvattnen)	0,00135 mg/l
PNEC aqua (havsvatten)	0,00135 mg/l
PNEC aqua (intermittent, sötvatten)	0,0083 mg/l
PNEC (Jord)	
PNEC jord	0,0221 mg/kg torrsvikt

8.1.5. control banding (kontroll av kemikaliehantering)

Ingen ytterligare information tillgänglig

8.2. Begränsning av exponeringen

8.2.1. Lämpliga tekniska kontrollåtgärder

Lämpliga tekniska kontrollåtgärder:

Säkerställ tillräcklig ventilation, särskild på instängda platser. Tillse att användning sker i slutet system. Ögontvättar för olycksfall samt nödduschar bör finnas i omedelbar närhet av varje potentiell exponering. Portable Diphoterine® eyewashers. Använd gnistfri och explosionssäker utrustning och belysningssystem.

8.2.2. Personlig skyddsutrustning

Personlig skyddsutrustning symbol(er):



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8.2.2.1. Ögonskydd och ansiktsskydd

Skyddsglasögon:

Vattentäta säkerhetsglasögon

Skyddsglasögon			
typ	Användning	Egenskaper	Standard
Skyddsglasögon	Stänk		EN 166

8.2.2.2. Hudskydd

Hudskydd:

Lämpliga skyddskläder skall användas

Hudskydd	
typ	Standard
Långärmad skyddande klädsel, tål kemiska produkter, Förkläde, Stövlar	EN 13034

Handskydd:

Använd skyddshandskar

Handskydd					
typ	Material	Genomträngning	Tjocklek (mm)	Genomträngning	Standard
Skyddshandskar	butylgummi	5 (> 240 minuter)	0.56		EN 374
Skyddshandskar	Viton® II	5 (> 240 minuter)	0.46		EN 374

8.2.2.3. Andningsskydd

Andningsskydd:

[Vid otillräcklig ventilation], använd andningsskydd.

Andningsskydd			
Anordning	Typ av filter	Villkor	Standard
Självförsörjande andningsapparat (SCBA) (SCBA)	Typ K - Ammoniak och aminer		EN 402

8.2.2.4. Termisk fara

Ingen ytterligare information tillgänglig

8.2.3. Begränsning av miljöexponeringen

Begränsning av miljöexponeringen:

Undvik utsläpp till miljön. Ingen begränsning av vilka släckningsmedel som får användas.

Annan information:

Se till att personalen är informerad och utbildad om arten av exponering och grundläggande åtgärder för att minimera exponeringen. Hantera i enlighet med god industriell hygien och säkerhetsrutiner. Ät inte, drick inte och rök inte när du använder produkten. Tvätta händerna omedelbart efter hantering av produkten.

AVSNITT 9: Fysikaliska och kemiska egenskaper

9.1. Information om grundläggande fysikaliska och kemiska egenskaper

Fysikaliskt tillstånd	: Vätska
Färg	: Färglös
Utseende	: Gas under tryck
Lukt	: Karakteristisk, kväljande
Luktkröskeln	: 5 – 25 ppm
Smältpunkt	: -78 °C (101.3 kPa)

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Frys punkt	: -78 °C (101.3 kPa)
Kokpunkt	: -33,4 °C (101.3 kPa)
Brännbarhet (fast, gas)	: Brandfarligt, Brandfarlig gas.
Explosiva egenskaper	: Inte explosiv
Brandfrämjande egenskaper	: Ej brännbart
Nedre explosionsgräns (LIE)	: Ej tillgänglig
Övre explosionsgräns (LSE)	: Ej tillgänglig
Flampunkt	: Ej tillgänglig
Självtändningstemperatur	: 651 °C (101.3 kPa)
Sönderdelningstemperatur	: 450 °C
pH-värde	: 11,7
Viskositet, kinematisk	: Ej tillgänglig
Viskositet, dynamisk	: 0.475 cP (@ -69°C), 0.317 cP (@ -50°C), 0.276 cP (@ -40°C), 0.255 cP (@ -33.5°C)
Löslighet	: Lösligt i: Metanol. Vatten: 51 – 53,1 g/100ml
Fördelningskoefficient för n-oktanol/vatten (Log Kow)	: Ej tillgänglig
Ångtryck	: 8611 hPa (20 °C)
Densitet	: 0,717 kg/m ³ (21 °C)
Relativ densitet	: 0,6386 (-33 °C) Relativ densitet, vätska (vatten=1)
Relativ ångdensitet vid 20°C	: 0,6 Relativ densitet, gas (luft=1)
Partikelegenskaper	: Ej tillämplig

9.2. Annan information

9.2.1. Information om faroklasser för fysisk fara

Explosionsgränser	: 15 – 28 vol % 101.3 kPa
Kritisk temperatur	: 133,4 °C

9.2.2. Andra säkerhetskaraktistika

Minsta antändningsenergi	: 680 mJ
Specifik ledningsförmåga	: 1.9e+007

AVSNITT 10: Stabilitet och reaktivitet

10.1. Reaktivitet

Brandfarlig gas.

10.2. Kemisk stabilitet

Stabil under normala förhållanden.

10.3. Risken för farliga reaktioner

Inga farliga reaktioner kända under normala användningsförhållanden.

10.4. Förhållanden som ska undvikas

Undvik kontakt med heta ytor. Värme. Inga lågor, inga gnistor. Eliminera alla antändningskällor.

10.5. Oförenliga material

Starka syror. Starka alkaliföreningar. Aluminium. Kromater. Koppar eller kopparinnehållande metaller. Halogener. Metalloxider. Nickel (Ni). Organiska material. Zink.

10.6. Farliga sönderdelningsprodukter

Inga farliga sönderdelningsprodukter bör bildas under normala lagrings- och användningsförhållanden. Farliga sönderdelningsprodukter. Kväveoxider. Väte.

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AVSNITT 11: Toxikologisk information

11.1. Information om faroklasser enligt förordning (EG) nr 1272/2008

Akut toxicitet (oral) : Inte klassificerat
Akut toxicitet (dermal) : Inte klassificerat
Akut toxicitet (inhalation) : Giftigt vid inandning.

Ammonia, anhydrous (7664-41-7)

LC50 Inandning - Råtta	9850 mg/m ³ Ammonia/air mixture, Exposure: 1h
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Frätande/irriterande på huden : Orsakar allvarliga frätskador på hud.
pH-värde: 11,7

Ammonia, anhydrous (7664-41-7)

pH-värde	11,6 (conc: 1 N at 25 °C (aqueous solution))
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Allvarlig ögonskada/ögonirritation : Antas orsaka allvarliga ögonskador
pH-värde: 11,7

Ammonia, anhydrous (7664-41-7)

pH-värde	11,6 (conc: 1 N at 25 °C (aqueous solution))
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Luftvägs-/hudsensibilisering : Inte klassificerat
Mutagenitet i könsceller : Inte klassificerat
Cancerogenitet : Inte klassificerat

Ammonia, anhydrous (7664-41-7)

NOAEL (kronisk, oral, djur/manlig, 2 år)	256 mg/kg kroppsvikt Animal: rat, Animal sex: male, Guideline: OECD Guideline 453 (Combined Chronic Toxicity / Carcinogenicity Studies), Remarks on results: other:Effect type: toxicity (migrated information)
NOAEL (kronisk, oral, djur/kvinnlig, 2 år)	284 mg/kg kroppsvikt Animal: rat, Animal sex: female, Guideline: OECD Guideline 453 (Combined Chronic Toxicity / Carcinogenicity Studies), Remarks on results: other:Effect type: toxicity (migrated information)

Reproduktionstoxicitet : Inte klassificerat
Specifik organotxicitet – enstaka exponering : Frätande för luftvägarna
Specifik organotxicitet – upprepade exponering : Inte klassificerat
Fara vid aspiration : Inte klassificerat

11.2. Information om andra faror

11.2.1. Hormonstörande egenskaper

Negativa hälsoeffekter som orsakas av hormonstörande egenskaper : Innehåller inga ämnen som har hormonstörande egenskaper

11.2.2. Annan information

Ingen ytterligare information tillgänglig

AVSNITT 12: Ekologisk information

12.1. Toxicitet

Farligt för vattenmiljön, omedelbara (akuta) effekter : Mycket giftigt för vattenlevande organismer.
Farligt för vattenmiljön, fördröjda (kroniska) effekter : Giftigt för vattenlevande organismer med långtidseffekter.

Ammonia, anhydrous (7664-41-7)

LC50 fiskar 1	0,068 mg/l Oncorhynchys gorboscha (96h)
EC50 Daphnia 1	101 mg/l Daphnia magna (48h)
EC50 72h - Alger [1]	2700 mg/l Chlorella vulgaris (18d)

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Ammonia, anhydrous (7664-41-7)

LOEC (kronisk)	1,3 mg/l Test organisms (species): Daphnia magna Duration: '96 h'
NOEC (kronisk)	0,79 mg/l Test organisms (species): Daphnia magna Duration: '96 h'
NOEC kronisk fisk	1,2 mg/l Oncorhynchus gorboscha (96h)

12.2. Persistens och nedbrytbarhet

Vattenfri ammoniak innehåller mindre än 0,5 % vatten (7664-41-7)

Persistens och nedbrytbarhet	Inte snabbt nedbrytbart
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Ammonia, anhydrous (7664-41-7)

Persistens och nedbrytbarhet	Snabbt biologiskt nedbrytbart.
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12.3. Bioackumuleringsförmåga

Ammonia, anhydrous (7664-41-7)

Fördelningskoefficient för n-oktanol/vatten (Log Pow)	0,23
Bioackumuleringsförmåga	Bioackumulering föga troligt.

12.4. Rörlighet i jord

Vattenfri ammoniak innehåller mindre än 0,5 % vatten (7664-41-7)

EKOLOGI - jord/mark	Rörlighet i jord bedöms vara begränsad, på grund av stark adsorption av ammoniumjoner till lermineral och bakteriell oxidation till nitrat. Ammonium i jord är i dynamisk jämvikt med nitrat och andra substrat i nitratscykeln.
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12.5. Resultat av PBT- och vPvB-bedömningen

Vattenfri ammoniak innehåller mindre än 0,5 % vatten (7664-41-7)

Detta ämne/blandning uppfyller inte PBT-kriterierna i REACH-förordningen, bilaga XIII
Detta ämne/blandning uppfyller inte vPvB-kriterierna i REACH-förordningen, bilaga XIII

12.6. Hormonstörande egenskaper

Negativa effekter på miljön som orsakas av hormonstörande egenskaper : Innehåller inga ämnen som har hormonstörande egenskaper.

12.7. Andra skadliga effekter

Ingen ytterligare information tillgänglig

AVSNITT 13: Avfallshantering

13.1. Avfallsbehandlingsmetoder

Avfallsbehandlingsmetoder : Lämna innehållet/behållaren i enlighet med godkänd avfallsinsamlares sorteringsanvisningar.

Rekommendationer för bortskaffande av produkt /förpackning : Tomma behållare skall återvinnas, återanvändas eller förstöras i enlighet med lokala bestämmelser.

Vattenfri ammoniak

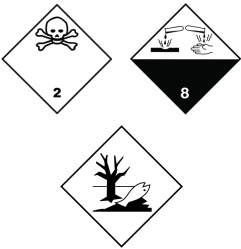
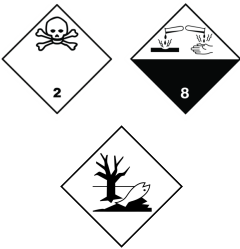
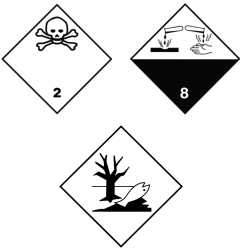
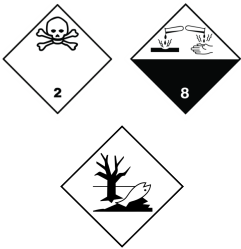
innehåller mindre än 0,5 % vatten

Säkerhetsdatablad

enligt REACH-förordningen (EG) 1907/2006 ändrad genom förordning (EU) 2020/878

AVSNITT 14: Transportinformation

I enlighet med ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
14.1. UN-nummer eller id-nummer				
UN 1005	UN 1005	UN 1005	UN 1005	UN 1005
14.2. Officiell transportbenämning				
AMMONIAK, VATTENFRI	AMMONIA, ANHYDROUS	Ammonia, anhydrous	AMMONIAK, VATTENFRI	AMMONIAK, VATTENFRI
14.3. Faroklass för transport				
2.3 (8)	2.3 (8)	2.3 (8)	2.3 (8)	2.3 (8)
				
14.4. Förpackningsgrupp				
Ej tillämplig	Ej tillämplig	Ej tillämplig	Ej tillämplig	Ej tillämplig
14.5. Miljöfaror				
Miljöfarlig: Ja	Miljöfarlig: Ja Marin förorening: Ja	Miljöfarlig: Ja	Miljöfarlig: Ja	Miljöfarlig: Ja
Ingen ytterligare information tillgänglig				

14.6. Särskilda skyddsåtgärder

Vägtransport

Transportreglering (ADR)
Orangefärgade skyltar

: Se transportföreskrifterna för särskilda försiktighetsåtgärder specifika för FN-nummer
:



Sjötransport

Transportreglering (IMDG)

: Se transportföreskrifterna för särskilda försiktighetsåtgärder specifika för FN-nummer

Flygtransport

Transportreglering (IATA)

: Se transportföreskrifterna för särskilda försiktighetsåtgärder specifika för FN-nummer

Insjötransport

Transportreglering (ADN)

: Se transportföreskrifterna för särskilda försiktighetsåtgärder specifika för FN-nummer

Järnvägstransport

Transportreglering (RID)

: Se transportföreskrifterna för särskilda försiktighetsåtgärder specifika för FN-nummer

14.7. Bulktransport till sjöss enligt IMO:s instrument

Ej tillämplig

Vattenfri ammoniak

innehåller mindre än 0,5 % vatten

Säkerhetsdatablad

enligt REACH-förordningen (EG) 1907/2006 ändrad genom förordning (EU) 2020/878

AVSNITT 15: Gällande föreskrifter

15.1. Föreskrifter/lagstiftning om ämnet eller blandningen när det gäller säkerhet, hälsa och miljö

15.1.1. EU-föreskrifter

Övriga bestämmelser, begränsningar och lagliga föreskrifter : Endast för yrkesmässigt bruk.

REACH-bilaga XVII (begränsningsvillkor)

Ej listad i REACH bilaga XVII

REACH-bilaga XIV (tillståndsförteckningen)

Ej listad i REACH bilaga XIV (auktorisationslista)

REACH-kandidatlista (SVHC)

Innehåller inga ämnen listade på REACH-kandidatlistan

PIC-förordning (EU 649/2012, tidigare informerat samtycke)

Ej listad på PIC-listan (förordning EU 649/2012)

POP-förordning (EU 2019/1021, långlivade organiska föreningar)

Ej listad på POP-listan (förordning EU 2019/1021)

Ozonförordningen (2024/590)

Ej listad på listan över ozonnedbrytning (förordning EU 2024/590)

Rådets förordning (EG) för kontroll av produkter med dubbla användningsområden

Innehåller inga ämnen som omfattas av RÅDETS FÖRORDNING (EG) för kontroll av produkter med dubbla användningsområden

Förordning om sprängämnesprekursorer (EU 2019/1148)

Innehåller inga ämnen som är upptagna i listan över sprängämnesprekursorer (förordning EU 2019/1148 om saluföring och användning av sprängämnesprekursorer)

Förordning om narkotikaprekursorer (EG 273/2004)

Innehåller inga ämnen som finns upptagna på listan över narkotikaprekursorer (förordning EC 273/2004 om tillverkning och utsläppande på marknaden av vissa ämnen som används vid olaglig tillverkning av narkotika och psykotropa ämnen)

15.1.2. Nationella föreskrifter

Ingen ytterligare information tillgänglig

15.2. Kemikaliesäkerhetsbedömning

En kemikaliesäkerhetsbedömning har utförts.

AVSNITT 16: Annan information

Hänvisningar om ändring(ar):

Ej tillämplig.

Förkortningar och akronymer:	
ADN	Den europeiska överenskommelsen om internationell transport av farligt gods på inre vattenvägar
ADR	Den europeiska överenskommelsen om internationell transport av farligt gods på väg
ATE	Uppskattning av akut toxicitet
BCF	Biokoncentrationsfaktor
CLP	Förordning (EG) nr 1272/2008 om klassificering, märkning och förpackning (CLP-förordningen)
DMEL	Härledd minimal effektnivå
DNEL	Härledd nolleffektnivå

Vattenfri ammoniak

innehåller mindre än 0,5 % vatten

Säkerhetsdatablad

enligt REACH-förordningen (EG) 1907/2006 ändrad genom förordning (EU) 2020/878

Förkortningar och akronymer:

EC50	Genomsnittlig effektiv koncentration
IARC	Internationella centret för cancerforskning
IATA	Internationella lufttransportsammanslutningen
IMDG	Internationella regler för sjötransport av farligt gods
LC50	Dödlig koncentration för 50 % av en testpopulation
LD50	Dödlig dos för 50% av en testpopulation (dödlig mediansdos)
LOAEL	Lägsta observerade effektnivå
NOAEC	Koncentration där ingen skadlig effekt observeras
NOAEL	Nivå där ingen skadlig effekt observeras
PNEC	Uppskattad nolleffektkoncentration
REACH	Registrering, utvärdering, godkännande och begränsning av kemikalier, förordning (EG) nr 1907/2006
RID	Regelverket för internationell transport av farligt gods på järnväg
SDS	Säkerhetsdatablad
STP	Avloppsreningsverk
vPvB	Mycket långlivat och mycket bioackumulerande ämne

H- och EUH-angivelsernas kompletta ordalydelse:

Acute Tox. 3 (Inhalation)	Akut inhalationstoxicitet, kategori 3
Aquatic Acute 1	Farligt för vattenmiljön – akut fara, kategori: akut 1
Aquatic Chronic 2	Farligt för vattenmiljön – fara för skadliga långtidseffekter, kategori: kronisk 2
Flam. Gas 2	Brandfarliga gaser, kategori 2
Press. Gas	Gaser under tryck
Press. Gas (Comp.)	Gaser under tryck : Komprimerad gas
Skin Corr. 1B	Frätande eller irriterande på huden, kategori 1, underkategori 1B
H221	Brandfarlig gas.
H280	Innehåller gas under tryck. Kan explodera vid uppvärmning.
H314	Orsakar allvarliga frätskador på hud och ögon.
H331	Giftigt vid inandning.
H400	Mycket giftigt för vattenlevande organismer.
H411	Giftigt för vattenlevande organismer med långtidseffekter.
EUH071	Frätande på luftvägarna.

Säkerhetsdatablad gäller för regioner : SE - Sverige

SDS EU (REACH-bilaga II) - RHDHV

På utgivningsdagen är uppgifterna i detta säkerhetsdatablad sanningsenliga såvitt vi vet. Informationen är enbart avsedd som en anvisning för säker hantering, användning, processning, lagring, transport, avfallshantering och utsläppning och bör inte ses som en garanti eller kvalitetsspecifikation. Informationen gäller endast det angivna specifika materialet och gäller nödvändigtvis inte i de fall där sådant material används tillsammans med vilket som helst annat material eller i vilken som helst process, om så inte angivits i texten.

1. EXPOSURE SCENARIO

Exposure scenario 1
Title Manufacturing

Use descriptors

Process categories

PROC1 - Use in closed process, no likelihood of exposure
PROC2 - Use in closed, continuous process with occasional controlled exposure (e.g. sampling)
PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15 - Use as laboratory reagent

Environmental Release Category ERC1 - Manufacture of substances

2. CONDITIONS OF USE AFFECTING EXPOSURE

Product characteristics

Physical state @20°C Liquid (Solution or Compressed gas).
Concentration of substance in product Covers percentage substance in the product up to 100 % (unless stated differently).

Amounts used

Site: 2000-3000 t/d
Region: 950000 t/y
Total: 6591429 t/y

Working area Indoor/outdoor use.
Process Continuous process.
System Handle substance within a closed system.
Frequency and duration of use Manufacturing: 24 h/d, 330-360 d/y. Operator: 8-12 h/d.
General measures Assumes a good basic standard of occupational hygiene is implemented.
Workers must be trained in the proper use and handling of this product as required under applicable regulations.
Wear protective gloves/protective clothing/eye protection/face protection, Boots, Helmet.

Contributing scenarios

Control of environmental exposure	
Environmental Release Category	ERC1 - Manufacture of substances
Product characteristics	Liquid
Amounts used	Site 2000-3000 t/d Region 950000 t/y Total 6591429 t/y
Frequency and duration of use	Continuous release

Control of worker exposure	
Process category	PROC1 - Use in closed process, no likelihood of exposure
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use Indoor use without local exhaust ventilation (LEV)

Process category	PROC2 - Use in closed, continuous process with occasional controlled exposure
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) Indoor use with local exhaust ventilation (LEV)

Process category	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
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Annex to the Safety Data Sheet
Exposure scenario 1: Manufacturing

Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) and gloves Indoor use with local exhaust ventilation (LEV)
Process category	PROC15 - Use as laboratory reagent
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Indoor use with local exhaust ventilation (LEV)

3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

Environment Exposure Estimation	
Environmental Release Category	ERC1 - Manufacture of substances
Release to Air	1.44 x 10 ⁵ kg/d
Release to Soil	0
Release to Water	1.73 x 10 ⁵ kg/d
Freshwater	PEC: 3.48 x 10 ⁻³ mg/L - Total Ammonia , 1.33 x 10 ⁻⁴ mg/L - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 0.121 Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)
Marine water	PEC: 7.61 x 10 ⁻⁴ mg/L - Total Ammonia , 3.15 x 10 ⁻⁵ mg/L - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 0.029 Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)

Health Exposure Estimation	
Process category	PROC1 - Use in closed process, no likelihood of exposure
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use <0.01 mg/m ³ , RCR: <0.01 - Respiratory Protection No Indoor use without local exhaust ventilation (LEV) 0.01 mg/m ³ , RCR: <0.01 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use / Indoor use without local exhaust ventilation (LEV) 0.34 mg/kg bw/d, RCR: 0.05 - No gloves

Process category	PROC2 - Use in closed, continuous process with occasional controlled exposure
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 1.24 mg/m ³ , RCR 0.09 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 3.54 mg/m ³ , RCR: 0.25 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 1.37 mg/kg bw/d, RCR: 0.20 - No gloves Indoor use with local exhaust ventilation (LEV) 0.14 mg/kg bw/d, RCR: 0.02 - No gloves

Process category	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 3.27 mg/m ³ , RCR: 0.27 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 3.19 mg/m ³ , RCR: 0.23 - Respiratory Protection No

Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 0.69 mg/kg bw/d, RCR: 0.10 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves
Process category	PROC15 - Use as laboratory reagent
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Indoor use with local exhaust ventilation (LEV) 3.54 mg/m ³ , RCR: 0.25 Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Indoor use with local exhaust ventilation (LEV) 0.03 mg/kg bw/d, RCR: 0.01 - No gloves

4. GUIDANCE TO DOWNSTREAM USER FOR EVALUATING EMPLOYEE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

Environmental exposure

Used EUSES model: EUSUS v2.1.

Non-standard assumptions: Required removal efficiency (wastewater) 100%.

Risk assessment: Based on Risk Characterisation Ratio (RCR), Calculation method.

Predicted No Effect Concentration (PNEC): Water, 0.0011 mg/L (Free Ammonia). No other PNEC's derived.

Control of worker exposure

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.

Risk assessment: Based on Risk Characterisation Ratio (RCR), Calculation method.

Used Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local,

Worker - dermal, short-term - systemic,

Worker - dermal, long-term - systemic.

Other DNEL's were not critical.

Guidance to check compliance with the exposure scenario

If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

For scaling see: ECETOC TRA, ART, STOFFENMANAGER, EUSES.

Further information on the assumptions contained in this exposure scenario can be found at: Website Model, ECETOC TRA and RIVM report 601450009, "Emission scenario document for biocides", 2001.

Workplace measurements:

Refer to European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) or equivalent national standard(s).

Refer to European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) or equivalent national standard(s).

Refer to European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) or equivalent national standard(s).

BOHS/NVVA guidance "Testing Compliance with Occupational Exposure Limits for Airborne Substances".

Workplace measurements - Method: <http://amcaw.ifa.dguv.de/substance/methoden/096-L-Ammonia.pdf>.

1. EXPOSURE SCENARIO

Exposure scenario Title	2 Formulation
Use descriptors	
Product category	PC1 - Adhesives, sealants PC9a - Coatings and paints, thinners, paint removers PC12 - Fertilisers PC14 - Metal surface treatment products, including galvanic and electroplating products PC16 - Heat transfer fluids PC18 - Ink and toners PC19 - Intermediates PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents, other unspecific PC21 - Laboratory chemicals PC26 - Paper and Board dye, finishing and impregnation products including bleaches and other processing aids PC29 - Pharmaceuticals PC30 - Photochemicals PC34 - Textile dyes, finishing and impregnating products including bleaches and other processing aids PC35 - Washing and cleaning products (including solvent based products) PC37 - Water treatment chemicals PC39 - Cosmetics, personal care products PC40 - Extraction agents
Process categories	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure (e.g. sampling) PROC3 - Use in closed batch process (synthesis or formulation); Industrial setting PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact) PROC8a - Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC15 - Use as laboratory reagent
Environmental Release Category	ERC2 - Formulation of mixtures

2. CONDITIONS OF USE AFFECTING EXPOSURE

Product characteristics	
Physical state @20°C	Liquid (Solution or Compressed gas).
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	Region 1000000 t/y Total 3829950 t/y
Working area	Indoor/outdoor use.
Process	Continuous process. Batch process.
System	Handle substance within a closed system.
Frequency and duration of use	Distributor: 0.25-2 h/d, 2-3 d/w. Operator: 3-6 h/d, 100 d/y.
General measures	Assumes a good basic standard of occupational hygiene is implemented. Workers must be trained in the proper use and handling of this product as required under applicable regulations. Wear protective gloves/protective clothing/eye protection/face protection, Boots, Helmet.

Contributing scenarios

Control of environmental exposure	
Environmental Release Category	ERC2 - Formulation of preparations (mixtures)
Product characteristics	Liquid
Amounts used	Region 1000000 t/y Total 3829950 t/y
Frequency and duration of use	Continuous release

Control of worker exposure	
Process category	PROC1 - Use in closed process, no likelihood of exposure
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use Indoor use without local exhaust ventilation (LEV)

Process category	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation)
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) Indoor use with local exhaust ventilation (LEV)

Process category	PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact) PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) and gloves Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE)

Process category	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) and gloves Indoor use with local exhaust ventilation (LEV)

Process category	PROC15 - Use as laboratory reagent
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Indoor use with local exhaust ventilation (LEV)

3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

Environment Exposure Estimation	
Environmental Release Category	ERC2 - Formulation of preparations (mixtures)
Release to Air	7.58×10^4 kg/d
Release to Soil	0
Release to Water	6.06×10^4 kg/d
Freshwater	PEC: 1.30×10^{-3} mg/L - Total Ammonia , 4.97×10^{-4} mg/L - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 0.045 Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)

Annex to the Safety Data Sheet
Exposure scenario 2: Formulation

Marine water	PEC: 3.14×10^{-4} mg/L - Total Ammonia , 1.20×10^{-5} mg/L - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 0.011 Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)
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Health Exposure Estimation

Process category	PROC1 - Use in closed process, no likelihood of exposure
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use <0.01 mg/m ³ , RCR: <0.01 - Respiratory Protection No Indoor use without local exhaust ventilation (LEV) 0.01 mg/m ³ , RCR: <0.01 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use / Indoor use without local exhaust ventilation (LEV) 0.34 mg/kg bw/d, RCR: 0.05 - No gloves

Process category	PROC2 - Use in closed, continuous process with occasional controlled exposure
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 1.24 mg/m ³ , RCR 0.09 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 3.54 mg/m ³ , RCR: 0.25 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 1.37 mg/kg bw/d, RCR: 0.20 - No gloves Indoor use with local exhaust ventilation (LEV) 0.14 mg/kg bw/d, RCR: 0.02 - No gloves

Process category	PROC3 - Use in closed batch process (synthesis or formulation)
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 2.48 mg/m ³ , RCR: 0.18 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 7.08 mg/m ³ , RCR: 0.51 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 0.34 mg/kg bw/d, RCR: 0.05 - No gloves Indoor use with local exhaust ventilation (LEV) 0.03 mg/kg bw/d, RCR: 0.01 - No gloves

Process category	PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact)
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 6.20 mg/m ³ , RCR: 0.44 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.89 mg/m ³ , RCR: 0.06 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 1.37 mg/kg bw/d, RCR: 0.20 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 1.37 mg/kg bw/d, RCR: 0.203 - No gloves

Process category	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 6.20 mg/m ³ , RCR: 0.44 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.89 mg/m ³ , RCR: 0.06 - Respiratory Protection Reduction 95%

Annex to the Safety Data Sheet
Exposure scenario 2: Formulation

Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 1.37 mg/kg bw/d, RCR: 0.20 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.14 mg/kg bw/d, RCR: 0.02 - No gloves
Process category	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 3.72 mg/m ³ , RCR: 0.27 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 3.19 mg/m ³ , RCR: 0.23 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 0.69 mg/kg bw/d, RCR: 0.10 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves
Process category	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 4.96 mg/m ³ , RCR: 0.35 - Respiratory Protection 95% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.71 mg/m ³ , RCR: 0.05 - Respiratory Protection Reduction 95%
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 0.69 mg/kg bw/d, RCR: 0.10 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves
Process category	PROC15 - Use as laboratory reagent
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Indoor use with local exhaust ventilation (LEV) 3.54 mg/m ³ , RCR: 0.25 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Indoor use without local exhaust ventilation (LEV) 0.03 mg/kg bw/d, RCR: 0.01 - No gloves

4. GUIDANCE TO DOWNSTREAM USER FOR EVALUATING EMPLOYEE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

Environmental exposure

Used EUSES model: EUSUS v2.1.

Non-standard assumptions: Required removal efficiency (wastewater) 100%.

Risk assessment: Based on Risk Characterisation Ratio (RCR), Calculation method.

Predicted No Effect Concentration (PNEC): Water, 0.0011 mg/L (Free Ammonia). No other PNEC's derived.

Control of worker exposure

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.

Risk assessment: Based on Risk Characterisation Ratio (RCR), Calculation method.

Used Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local,

Worker - dermal, short-term - systemic,

Worker - dermal, long-term - systemic.

Other DNEL's were not critical.

Guidance to check compliance with the exposure scenario

If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

For scaling see: ECETOC TRA, ART, STOFFENMANAGER, EUSES.

Further information on the assumptions contained in this exposure scenario can be found at: Website Model, ECETOC TRA and RIVM report 601450009, "Emission scenario document for biocides", 2001.

Workplace measurements:

Refer to European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) or equivalent national standard(s).

Refer to European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) or equivalent national standard(s).

Refer to European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) or equivalent national standard(s).

BOHS/NVVA guidance "Testing Compliance with Occupational Exposure Limits for Airborne Substances".

Workplace measurements - Method: <http://amcaw.ifa.dguv.de/substance/methoden/096-L-Ammonia.pdf>.

1. EXPOSURE SCENARIO

Exposure scenario Title	3 Intermediate
Use descriptors	
Sector of use	SU1 - Agriculture, forestry, fishery SU5 - Manufacture of textiles, leather, fur SU8 - Manufacture of bulk, large scale chemicals (including petroleum products) SU9 - Manufacture of fine chemicals SU12 - Manufacture of plastics products, including compounding and conversion SU24 - Scientific research and development
Product category	PC19 - Intermediates
Process categories	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure (e.g. sampling) PROC3 - Use in closed batch process (synthesis or formulation); Industrial setting PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact) PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC15 - Use as laboratory reagent
Environmental Release Category	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

2. CONDITIONS OF USE AFFECTING EXPOSURE

Product characteristics	
Physical state @20°C	Liquid (Solution or Compressed gas).
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	Region: 800000 t/y Total: 6591429 t/y
Working area	Indoor/outdoor use.
Process	Continuous process.
System	Handle substance within a closed system.
Frequency and duration of use	Manufacturing: 24 h/d, 330-360 d/y. Operator: 8-12 h/d.
General measures	Assumes a good basic standard of occupational hygiene is implemented. Workers must be trained in the proper use and handling of this product as required under applicable regulations. Wear protective gloves/protective clothing/eye protection/face protection, Boots, Helmet.

Contributing scenarios

Control of environmental exposure	
Environmental Release Category	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Product characteristics	Liquid
Amounts used	Site 2000-3000 t/d Region 950000 t/y Total 6591429 t/y
Frequency and duration of use	Continuous release

Control of worker exposure	
Process category	PROC1 - Use in closed process, no likelihood of exposure
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Indoor use without local exhaust ventilation (LEV) Outdoor use
Process category	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation)
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Indoor use with local exhaust ventilation (LEV) Outdoor use with respiratory protection equipment (RPE)
Process category	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) and gloves Indoor use with local exhaust ventilation (LEV)
Process category	PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact) PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) and gloves Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE)
Process category	PROC15 - Use as laboratory reagent
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Indoor use with local exhaust ventilation (LEV)

3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

Environment Exposure Estimation	
Environmental Release Category	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Release to Air	1.21×10^5 kg/d
Release to Water	4.85×10^4 kg/d
Freshwater	PEC: 2.19×10^{-3} mg/L - Total Ammonia , 8.37×10^{-4} mg/L - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 0.076 Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)
Marine water	PEC: 5.37×10^{-4} mg/L - Total Ammonia , 2.05×10^{-5} mg/L - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 0.019 Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)
Health Exposure Estimation	
Process category	PROC1 - Use in closed process, no likelihood of exposure

Annex to the Safety Data Sheet
Exposure scenario 3: Intermediate

Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use <0.01 mg/m ³ , RCR: <0.01 - Respiratory Protection No Indoor use without local exhaust ventilation (LEV) 0.01 mg/m ³ , RCR: <0.01 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use / Indoor use without local exhaust ventilation (LEV) 0.34 mg/kg bw/d, RCR: 0.05 - No gloves
Process category	PROC2 - Use in closed, continuous process with occasional controlled exposure
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 1.24 mg/m ³ , RCR 0.09 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 3.54 mg/m ³ , RCR: 0.25 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 1.37 mg/kg bw/d, RCR: 0.20 - No gloves Indoor use without local exhaust ventilation (LEV) 0.14 mg/kg bw/d, RCR: 0.02 - No gloves
Process category	PROC3 - Use in closed batch process (synthesis or formulation)
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 2.48 mg/m ³ , RCR: 0.18 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 7.08 mg/m ³ , RCR: 0.51 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 0.34 mg/kg bw/d, RCR: 0.05 - No gloves Indoor use with local exhaust ventilation (LEV) 0.03 mg/kg bw/d, RCR: 0.01 - No gloves
Process category	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 2.48 mg/m ³ , RCR: 0.18 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 7.08 mg/m ³ , RCR: 0.51 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 0.69 mg/kg bw/d, RCR: 0.10 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves
Process category	PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact)
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 6.20 mg/m ³ , RCR: 0.44 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.89 mg/m ³ , RCR: 0.06 - Respiratory Protection Reduction 95%
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 1.37 mg/kg bw/d, RCR: 0.20 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.07 mg/kg bw/d, RCR: 0.01 - No gloves
Process category	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Annex to the Safety Data Sheet
Exposure scenario 3: Intermediate

Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 3.72 mg/m ³ , RCR: 0.27 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 3.19 mg/m ³ , RCR: 0.23 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 0.69 mg/kg bw/d, RCR: 0.10 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves
Process category	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 4.69 mg/m ³ , RCR: 0.35 - Respiratory Protection 95% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.71 mg/m ³ , RCR: 0.05 - Respiratory Protection Reduction 95%
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 0.69 mg/kg bw/d, RCR: 0.10 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves
Process category	PROC15 - Use as laboratory reagent
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Indoor use without local exhaust ventilation (LEV) 3.54 mg/m ³ , RCR: 0.25 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Indoor use without local exhaust ventilation (LEV) 0.03 mg/kg bw/d, RCR: 0.01 - No gloves

4. GUIDANCE TO DOWNSTREAM USER FOR EVALUATING EMPLOYEE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

Environmental exposure

Used EUSES model: EUSUS v2.1.

Non-standard assumptions: Required removal efficiency (wastewater) 100%.

Risk assessment: Based on Risk Characterisation Ratio (RCR), Calculation method.

Predicted No Effect Concentration (PNEC): Water, 0.0011 mg/L (Free Ammonia). No other PNEC's derived.

Control of worker exposure

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.

Risk assessment: Based on Risk Characterisation Ratio (RCR), Calculation method.

Used Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local,

Worker - dermal, short-term - systemic,

Worker - dermal, long-term - systemic.

Other DNEL's were not critical.

Guidance to check compliance with the exposure scenario

Annex to the Safety Data Sheet
Exposure scenario 3: Intermediate

If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

For scaling see: ECETOC TRA, ART, STOFFENMANAGER, EUSES.

Further information on the assumptions contained in this exposure scenario can be found at: Website Model, ECETOC TRA and RIVM report 601450009, "Emission scenario document for biocides", 2001.

Workplace measurements:

Refer to European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) or equivalent national standard(s).

Refer to European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) or equivalent national standard(s).

Refer to European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) or equivalent national standard(s).

BOHS/NVVA guidance "Testing Compliance with Occupational Exposure Limits for Airborne Substances".

Workplace measurements - Method: <http://amcaw.ifa.dguv.de/substance/methoden/096-L-Ammonia.pdf>.

1. EXPOSURE SCENARIO

**Exposure scenario
Title**

**4
Industrial use**

Use descriptors

Sector of use

SU4 - Manufacture of food products
SU5 - Manufacture of textiles, leather, fur
SU6a - Manufacture of wood and wood products
SU6b - Manufacture of pulp, paper and paper products
SU8 - Manufacture of bulk, large scale chemicals (including petroleum products)
SU9 - Manufacture of fine chemicals
SU13 - Manufacture of other non-metallic mineral products, e.g. plasters, cement
SU15 - Manufacture of fabricated metal products, except machinery and equipment
SU16 - Manufacture of computer, electronic and optical products, electrical equipment
SU23 - Recycling
SU0 - Other

Product category

PC0 - Other: Other products (production of life microorganism)
PC1 - Adhesives, sealants
PC9a - Coatings and paints, thinners, paint removers
PC14 - Metal surface treatment products, including galvanic and electroplating products
PC15 - Non-metal-surface treatment products
PC16 - Heat transfer fluids
PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents, other unspecific
PC26 - Paper and Board dye, finishing and impregnation products including bleaches and other processing aids
PC29 - Pharmaceuticals
PC30 - Photochemicals
PC34 - Textile dyes, finishing and impregnating products including bleaches and other processing aids
PC35 - Washing and cleaning products (including solvent based products)
PC37 - Water treatment chemicals
PC39 - Cosmetics, personal care products
PC40 - Extraction agents

Process categories

PROC1 - Use in closed process, no likelihood of exposure
PROC2 - Use in closed, continuous process with occasional controlled exposure (e.g. sampling)
PROC3 - Use in closed batch process (synthesis or formulation); Industrial setting
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact)
PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/ large containers at dedicated facilities
PROC9 - Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC13 - Treatment of articles by dipping and pouring

Environmental Release Category

ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
ERC5 - Industrial use resulting in inclusion into or onto a matrix
ERC6b - Industrial use of reactive processing aids
ERC7 - Industrial use of substances in closed systems

2. CONDITIONS OF USE AFFECTING EXPOSURE

Product characteristics

Physical state @20°C

Liquid (Solution or Compressed gas).

Concentration of substance in product Covers percentage substance in the product up to 100 % (unless stated differently).

Amounts used Region: 25000 t/y
Total: 354631 t/y

Working area Indoor/outdoor use.

Process Continuous process. Batch process.

System Handle substance within a closed system.

General measures Assumes a good basic standard of occupational hygiene is implemented.
Workers must be trained in the proper use and handling of this product as required under applicable regulations.
Wear protective gloves/protective clothing/eye protection/face protection, Boots, Helmet.

Contributing scenarios

Control of environmental exposure	
Environmental Release Category	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles ERC5 - Industrial use resulting in inclusion into or onto a matrix ERC6b - Industrial use of reactive processing aids ERC7 - Industrial use of substances in closed systems
Product characteristics	Liquid
Amounts used	Region 25000 t/y Total 354631 t/y
Frequency and duration of use	Continuous release

Control of worker exposure	
Process category	PROC1 - Use in closed process, no likelihood of exposure
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use Indoor use without local exhaust ventilation (LEV)

Process category	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation)
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) Indoor use with local exhaust ventilation (LEV)

Process category	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) and gloves Indoor use with local exhaust ventilation (LEV)

Process category	PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact) PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13 - Treatment of articles by dipping and pouring
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) and gloves Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE)

3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

Annex to the Safety Data Sheet
Exposure scenario 4: Industrial use

Environment Exposure Estimation	
Environmental Release Category	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Release to Air	7.15 x 10 ⁴ kg/d
Release to Water	7.52 x 10 ⁴ kg/d
Freshwater	PEC: 2.82 x 10 ⁻³ mg/L - Total Ammonia , 1.08 x 10 ⁻⁴ - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 0.098 Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)
Marine water	PEC: 6.06 x 10 ⁻⁴ mg/L - Total Ammonia , 2.31 x 10 ⁻⁵ - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 0.021 Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)
Environmental Release Category	ERC5 - Industrial use resulting in inclusion into or onto a matrix
Release to Air	3.76 x 10 ⁴ kg/d
Release to Water	3.76 x 10 ⁴ kg/d
Freshwater	PEC: 1.46 x 10 ⁻³ mg/L - Total Ammonia , 5.58 x 10 ⁻⁵ - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 0.051 Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)
Marine water	PEC: 3.17 x 10 ⁻⁴ mg/L - Total Ammonia , 1.21 x 10 ⁻⁵ - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 0.011 Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)
Environmental Release Category	ERC6b - Industrial use of reactive processing aids
Release to Air	75.2 kg/d
Release to Water	3760 kg/d
Freshwater	PEC: 4.54 x 10 ⁻⁵ mg/L - Total Ammonia , 1.73 x 10 ⁻⁶ - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 1.58 x 10 ⁻³ Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)
Marine water	PEC: 5.19 x 10 ⁻⁶ mg/L - Total Ammonia , 1.98 x 10 ⁻⁷ - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 1.80 x 10 ⁻⁴ Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)
Environmental Release Category	ERC7 - Industrial use of substances in closed systems
Release to Air	3760 kg/d
Release to Water	3760 kg/d
Freshwater	PEC: 1.46 x 10 ⁻⁴ mg/L - Total Ammonia , 5.58 x 10 ⁻⁶ - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 5.07 x 10 ⁻³ Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)
Marine water	PEC: 3.17 x 10 ⁻⁵ mg/L - Total Ammonia , 1.21 x 10 ⁻⁶ - Free Ammonia PNEC: 0.0011 mg/L - Free Ammonia RCR: 1.10 x 10 ⁻³ Discussion Conversion from Total Ammonia to Free Ammonia based on a fraction of 3.82%, given for pH 8 and 25 °C (Ref data in EPA document EPA-600/3-79-091)
Health Exposure Estimation	
Process category	PROC1 - Use in closed process, no likelihood of exposure

Annex to the Safety Data Sheet
Exposure scenario 4: Industrial use

Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use <0.01 mg/m ³ , RCR: <0.01 - Respiratory Protection No Indoor use without local exhaust ventilation (LEV) 0.01 mg/m ³ , RCR: <0.01 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use / Indoor use without local exhaust ventilation (LEV) 0.34 mg/kg bw/d, RCR: 0.05 - No gloves
Process category	PROC2 - Use in closed, continuous process with occasional controlled exposure
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 1.24 mg/m ³ , RCR 0.09 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 3.54 mg/m ³ , RCR: 0.25 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 1.37 mg/kg bw/d, RCR: 0.20 - No gloves Indoor use with local exhaust ventilation (LEV) 0.14 mg/kg bw/d, RCR: 0.02 - No gloves
Process category	PROC3 - Use in closed batch process (synthesis or formulation)
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 2.48 mg/m ³ , RCR: 0.18 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 7.08 mg/m ³ , RCR: 0.51 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 0.34 mg/kg bw/d, RCR: 0.05 - No gloves Indoor use with local exhaust ventilation (LEV) 0.03 mg/kg bw/d, RCR: 0.01 - No gloves
Process category	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 2.48 mg/m ³ , RCR: 0.18 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 7.08 mg/m ³ , RCR: 0.51 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 0.69 mg/kg bw/d, RCR: 0.10 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves
Process category	PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact)
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 6.20 mg/m ³ , RCR: 0.44 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.89 mg/m ³ , RCR: 0.06 - Respiratory Protection Reduction 95%
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 1.37 mg/kg bw/d, RCR: 0.20 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.07 mg/kg bw/d, RCR: 0.01 - No gloves
Process category	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Annex to the Safety Data Sheet
Exposure scenario 4: Industrial use

Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 3.72 mg/m ³ , RCR: 0.27 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 3.19 mg/m ³ , RCR: 0.23 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 0.69 mg/kg bw/d, RCR: 0.10 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves
Process category	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 4.96 mg/m ³ , RCR: 0.35 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.71 mg/m ³ , RCR: 0.05 - Respiratory Protection 95%
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 0.69 mg/kg bw/d, RCR: 0.10 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves
Process category	PROC13 - Treatment of articles by dipping and pouring
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 6.20 mg/m ³ , RCR: 0.44 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.89 mg/m ³ , RCR: 0.06 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 1.37 mg/kg bw/d, RCR: 0.20 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves

4. GUIDANCE TO DOWNSTREAM USER FOR EVALUATING EMPLOYEE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

Environmental exposure

Used EUSES model: EUSUS v2.1.

Non-standard assumptions: Required removal efficiency (wastewater) 100%.

Risk assessment: Based on Risk Characterisation Ratio (RCR), Calculation method.

Predicted No Effect Concentration (PNEC): Water, 0.0011 mg/L (Free Ammonia). No other PNEC's derived.

Control of worker exposure

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.

Risk assessment: Based on Risk Characterisation Ratio (RCR), Calculation method.

Used Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local,

Worker - dermal, short-term - systemic,

Worker - dermal, long-term - systemic.

Other DNEL's were not critical.

Guidance to check compliance with the exposure scenario

Annex to the Safety Data Sheet
Exposure scenario 4: Industrial use

If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

For scaling see: ECETOC TRA, ART, STOFFENMANAGER, EUSES.

Further information on the assumptions contained in this exposure scenario can be found at: Website Model, ECETOC TRA and RIVM report 601450009, "Emission scenario document for biocides", 2001.

Workplace measurements:

Refer to European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) or equivalent national standard(s).

Refer to European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) or equivalent national standard(s).

Refer to European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) or equivalent national standard(s).

BOHS/NVVA guidance "Testing Compliance with Occupational Exposure Limits for Airborne Substances".

Workplace measurements - Method: <http://amcaw.ifa.dguv.de/substance/methoden/096-L-Ammonia.pdf>.

1. EXPOSURE SCENARIO

Exposure scenario
Title

5
Professional use

Use descriptors

Sector of use

SU1 - Agriculture, forestry, fishery
SU4 - Manufacture of food products
SU5 - Manufacture of textiles, leather, fur
SU6a - Manufacture of wood and wood products
SU6b - Manufacture of pulp, paper and paper products
SU8 - Manufacture of bulk, large scale chemicals (including petroleum products)
SU9 - Manufacture of fine chemicals
SU10 - Formulation [mixing] of preparations and/or re-packaging
SU11 - Manufacture of rubber products
SU12 - Manufacture of plastics products, including compounding and conversion
SU15 - Manufacture of fabricated metal products, except machinery and equipment
SU16 - Manufacture of computer, electronic and optical products, electrical equipment
SU23 - Recycling
SU24 - Scientific research and development
SU0 - Other

Product category

PC9a - Coatings and paints, thinners, paint removers
PC12 - Fertilisers
PC14 - Metal surface treatment products, including galvanic and electroplating products
PC15 - Non-metal-surface treatment products
PC16 - Heat transfer fluids
PC19 - Intermediates
PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents, other unspecific
PC21 - Laboratory chemicals
PC29 - Pharmaceuticals
PC30 - Photochemicals
PC37 - Water treatment chemicals
PC40 - Extraction agents

Process categories

PROC1 - Use in closed process, no likelihood of exposure
PROC2 - Use in closed, continuous process with occasional controlled exposure (e.g. sampling)
PROC3 - Use in closed batch process (synthesis or formulation); Industrial setting
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact)
PROC8a - Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9 - Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC13 - Treatment of articles by dipping and pouring
PROC15 - Use as laboratory reagent
PROC20 - Heat and pressure transfer fluids in dispersive use but closed systems

Environmental Release Category

ERC8b - Wide dispersive indoor use of reactive substances in open systems
ERC8e - Wide dispersive outdoor use of reactive substances in open systems
ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix
ERC9a - Wide dispersive indoor use of substances in closed systems
ERC9b - Wide dispersive outdoor use of substances in closed systems

2. CONDITIONS OF USE AFFECTING EXPOSURE

Product characteristics

Annex to the Safety Data Sheet
Exposure scenario 5: Professional use

Physical state @20°C Liquid (Solution or Compressed gas).
Concentration of substance in product Covers percentage substance in the product up to 100 % (unless stated differently).

Working area Indoor/outdoor use.
Process Continuous process. Batch process.
System Handle substance within a closed system.
General measures Assumes a good basic standard of occupational hygiene is implemented.
 Workers must be trained in the proper use and handling of this product as required under applicable regulations.
 Wear protective gloves/protective clothing/eye protection/face protection, Boots, Helmet.

Contributing scenarios

Control of environmental exposure	
Environmental Release Category	ERC8b - Wide dispersive indoor use of reactive substances in open systems ERC8e - Wide dispersive outdoor use of reactive substances in open systems ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC9a - Wide dispersive indoor use of substances in closed systems ERC9b - Wide dispersive outdoor use of substances in closed systems
Frequency and duration of use	No significant effect

Control of worker exposure	
Process category	PROC1 - Use in closed process, no likelihood of exposure
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use Indoor use without local exhaust ventilation (LEV)

Process category	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) Indoor use with local exhaust ventilation (LEV)

Process category	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) and gloves Indoor use with local exhaust ventilation (LEV)

Process category	PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact) PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13 - Treatment of articles by dipping and pouring
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Outdoor use with respiratory protection equipment (RPE) and gloves Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE)

Process category	PROC15 - Use as laboratory reagent
Frequency and duration of use	>4 h
Technical conditions and measures to control dispersion from source towards the worker	Indoor use with local exhaust ventilation (LEV)

3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

Health Exposure Estimation

Process category	PROC1 - Use in closed process, no likelihood of exposure
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use <0.01 mg/m ³ , RCR: <0.01 - Respiratory Protection No Indoor use without local exhaust ventilation (LEV) 0.01 mg/m ³ , RCR: <0.01 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use / Indoor use without local exhaust ventilation (LEV) 0.34 mg/kg bw/d, RCR: 0.05 - No gloves

Process category	PROC2 - Use in closed, continuous process with occasional controlled exposure
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 1.24 mg/m ³ , RCR 0.09 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 3.54 mg/m ³ , RCR: 0.25 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 1.37 mg/kg bw/d, RCR: 0.20 - No gloves Indoor use with local exhaust ventilation (LEV) 0.14 mg/kg bw/d, RCR: 0.02 - No gloves

Process category	PROC3 - Use in closed batch process (synthesis or formulation)
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 2.48 mg/m ³ , RCR: 0.18 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 7.08 mg/m ³ , RCR: 0.51 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 0.34 mg/kg bw/d, RCR: 0.05 - No gloves Indoor use with local exhaust ventilation (LEV) 0.03 mg/kg bw/d, RCR: 0.01 - No gloves

Process category	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 2.48 mg/m ³ , RCR: 0.18 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 7.08 mg/m ³ , RCR: 0.51 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 0.69 mg/kg bw/d, RCR: 0.10 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves

Process category	PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact)
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 6.20 mg/m ³ , RCR: 0.44 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.89 mg/m ³ , RCR: 0.06 - Respiratory Protection Reduction 95%
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 1.37 mg/kg bw/d, RCR: 0.20 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment

Annex to the Safety Data Sheet
Exposure scenario 5: Professional use

	(RPE) 0.07 mg/kg bw/d, RCR: 0.01 - No gloves
Process category	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 6.20 mg/m ³ , RCR: 0.44 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.89 mg/m ³ , RCR: 0.06 - Respiratory Protection Reduction 95%
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 1.37 mg/kg bw/d, RCR: 0.20 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.14 mg/kg bw/d, RCR: 0.02 - No gloves
Process category	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 3.72 mg/m ³ , RCR: 0.27 - Respiratory Protection 95% Indoor use with local exhaust ventilation (LEV) 3.19 mg/m ³ , RCR: 0.23 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 0.69 mg/kg bw/d, RCR: 0.10 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves
Process category	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 4.96 mg/m ³ , RCR: 0.35 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.71 mg/m ³ , RCR: 0.05 - Respiratory Protection Reduction 95%
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 0.69 mg/kg bw/d, RCR: 0.10 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves
Process category	PROC13 - Treatment of articles by dipping and pouring
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 6.20 mg/m ³ , RCR: 0.44 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.89 mg/m ³ , RCR: 0.06 - Respiratory Protection 95%
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) and gloves 1.37 mg/kg bw/d, RCR: 0.20 - Gloves Reduction 90% Indoor use with local exhaust ventilation (LEV) and respiratory protection equipment (RPE) 0.69 mg/kg bw/d, RCR: 0.10 - No gloves
Process category	PROC15 - Use as laboratory reagent
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Indoor use with local exhaust ventilation (LEV) 3.54 mg/m ³ , RCR: 0.25 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Indoor use without local exhaust ventilation (LEV) 0.03 mg/kg bw/d, RCR: 0.01 - No gloves

Annex to the Safety Data Sheet
Exposure scenario 5: Professional use

Process category	PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Long-term exposure - Local effects - Inhalation	>4 h Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 1.24 mg/m ³ , RCR: 0.09 - Respiratory Protection Reduction 95% Indoor use with local exhaust ventilation (LEV) 7.08 mg/m ³ , RCR: 0.51 - Respiratory Protection No
Acute / short-term exposure - Systemic effects - Dermal	Exposure concentrations Outdoor use with respiratory protection equipment (RPE) 1.71 mg/kg bw/d, RCR: 0.25 - No gloves Indoor use with local exhaust ventilation (LEV) 0.14 mg/kg bw/d, RCR: 0.02 - No gloves

4. GUIDANCE TO DOWNSTREAM USER FOR EVALUATING EMPLOYEE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

Environmental exposure

Used EUSES model: EUSUS v2.1.
Non-standard assumptions: Required removal efficiency (wastewater) 100%.
Risk assessment: Based on Risk Characterisation Ratio (RCR), Calculation method.
Predicted No Effect Concentration (PNEC): Water, 0.0011 mg/L (Free Ammonia). No other PNEC's derived.

Control of worker exposure

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.
Risk assessment: Based on Risk Characterisation Ratio (RCR), Calculation method.
Used Derived No Effect Level (DNEL):
Worker - inhalative, long-term - local,
Worker - dermal, short-term - systemic,
Worker - dermal, long-term - systemic.
Other DNEL's were not critical.

Guidance to check compliance with the exposure scenario

If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.

For scaling see: ECETOC TRA, ART, STOFFENMANAGER, EUSES.

Further information on the assumptions contained in this exposure scenario can be found at: Website Model, ECETOC TRA and RIVM report 601450009, "Emission scenario document for biocides", 2001.

Workplace measurements:

Refer to European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) or equivalent national standard(s).
Refer to European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) or equivalent national standard(s).
Refer to European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) or equivalent national standard(s).
BOHS/NVVA guidance "Testing Compliance with Occupational Exposure Limits for Airborne Substances".
Workplace measurements - Method: <http://amcaw.ifa.dguv.de/substance/methoden/096-L-Ammonia.pdf>.