

SAFETY DATA SHEET (1907/2006)

R0717139

KI-3161 CONC; RS-9108

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ANNEX

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1. General aspects

1.1 Worker exposure: General hazards

Amidoamines and Imidazolines are produced in indoor factories in a batch process in ventilated facilities. The maximum reaction temperature and pressure during production is 230°C at atmospheric pressure. The final product is transferred to a storage tank.

Cleaning of reactors is performed as a closed process, waste is directed to sewage.

Packaging of substance takes place in dedicated equipment to bulk containers, IBC or drums.

Quality control at laboratory may be performed by process operators or laboratory personnel.

The substance is corrosive and also a dermal sensitiser. To protect eyes and skin, Personal Protective Equipment (PPE) like goggles, chemical resistant gloves and protective clothing shall be worn.

1.2 Worker exposure: Skin

Skin sensitization:

Gloves:

Implemented as an additional RMM. The following effectiveness values are assumed: Use of suitable gloves: 80%; Use of suitable gloves in combination with basic employee training: 90%; Use of suitable gloves in combination with specific activity training: 95%; Use of suitable gloves in combination with intensive management supervision controls: 99%

1.3 Environment: General considerations

<u>AIR</u>:

The substance is of low volatility and release to air is considered not to be relevant.

WATER:

The main release route is via waste water. All industrial surfaces should be hard surfaces, and run-off should be led to waste. Waste water should be treated by STP. Defaults for dilution and effluent flow are assumed.

SOIL:

No exposure to soil is expected. No application of STP sludge to soil is assumed.

Degradation rates in STP is from test results of simulation tests :

Fraction of emission directed to water by local STP	0.00001
Fraction of emission directed to sludge by local STP	0.00044
Fraction of emission degraded by local STP	0.99955

1.4 Consumer exposure

Not applicable ..

1.5 Overview of exposure scenarios

Number (ES)	Short description of exposure scenario	Sector of use (SU)	Process category (PROC)	Article Category (AC)	Environmental release category (ERC)
1	Manufacturing of substance	3	3, 8b, 15	NA	1
2	Formulation	10	3, 8b, 15	NA	2
3	Use as an intermediate	3	3, 8b, 15	NA	ба

Table 1 Short description of all exposure scenarios with their use descriptors and life cycle stage

NA= Not Applicable

2. Exposure scenario: Manufacturing of substance (ES1)

2.1 Workers

Table 2: Description of ES 1 and its contributing scenarios

Reference number	ES 1				
Free short title	Industrial manufacture of chemical substances in chemical syntheses				
Systematic title based on use descriptor	Batch manufacture of a chemical where the predominant handling is in a contained manner, e.g. through enclosed transfers, but where some opportunity for contact with chemicals occurs, e.g. through sampling. (PROC 3, 8b)				
Processes, tasks, activities covered	 PROC 3: Industrial manufacture of chemical substances, including cleaning of the equipment. PROC 8b: Transfer of substance or preparation (charging) to vessels/large containers at dedicated facilities. PROC 15: QC Laboratory 				
Environment characteristic covered	ERC 1: Manufacture of substa	ances			
Assessment Method	ECETOC TRA Worker v2.0 TGD Excel				
Name of contributing scenario	Batch manufacture of a chemical or formulation where the predominant handling is in a contained manner				
Use descriptor covered	PROC 3				
Processes, tasks activities covered	1. Industrial manufacture of chemical substances				
	2. Sampling				
	3. Charging to storage tanks in	n enclosed system			
	4. Cleaning of the process equ	ipment in closed systems.			
Product characteristic	The substance is a liquid at the	a progage tomporaturae			
Vapour pressure	Vapour pressure at 20°C is 8*10 ⁻⁸ Pa.				
Concentration of substance	100 %				
Amounts used					
Not relevant					
Frequency and duration of use/exposure					
Duration of exposure	>4	hours/day			
Frequency of exposure	< 240 davs/year				
Human factors not influenced by risk manag	gement				
The work performed is of light character, result	ing in a default respiration volu	me on 10m ³ /8h shift.			
Other given operational conditions affecting	workers exposure				
Location	Indoors				
Domain	Industrial				
Technical conditions and measures at process level (source) to prevent release					
Enclosed transfers. Sampling with LEV. Spill containment at all input/output points.					
Technical conditions and measures to contro	l dispersion from source towa	rds the worker			
Local exhaust ventilation required	No				

Organisational measures to prevent /limit releases, dispersion and exposure						
-						
Conditions and measures related to personal protection, hygiene and health evaluation						
Respiratory protection required	No					
Personal protective equipment	Vas		Ch	Chemical resistant gloves: 90%		
r ersonar protective equipment	1 05		pro	protective clothing, eye protection		
Name of contributing scenario		Pack cont	agir aine	ging of chemical substances into bulk transport, IBC iners or drums.		
Systematic title based on use descriptor Trans from/ PRO0		Insfer of substance or preparation (charging/discharging) m/to vessels/large containers at dedicated facilities - OC 8b				
Processes, tasks activities covered		1. Fi 2. Fi 2. Fi	lling lling	of bulk transport of IBC containers		
Product characteristic		Э. ГІ	111112	, or druins		
Physical state		The	subs	tance is a liquid at the	e process temperatures.	
Vapour pressure		Vap	our p	pressure at 20°C is 8*	10 ⁻⁸ Pa.	
Concentration of substance		100	subs %	tance is regarded as a	low volatility substance ¹ .	
Amounts used		100	/0			
Not relevant						
Frequency and duration of use/exp	oosure					
Duration of exposure	exposure 1.:15		5 -60 d 3	r > d	min/day	
Frequency of exposure < 240		0		days/year		
Human factors not influenced by risk management			at			
The work performed is of light character, resulting in a default respiration volume on 10m ³ /8h shift.						
Other given operational conditions affecting workers exposure						
Location Outdoors/Indoors						
Domain Indus		stria	1			
Technical conditions and measure	s at proc	ess level	(50	urce) to prevent relea	ase	
None				, 1		
Technical conditions and measure	s to cont	rol dispe	ersio	on from source towar	rds the worker	
Local exhaust ventilation required]	No				
Organisational measures to preven	nt /limit	releases,	dis	persion and exposure	e	
- · · · · · · · ·						
Conditions and measures related to personal protection, hygiene and health evaluation						
Respiratory protection required	aired No					
Personal protective againment				Chemical resistant gloves: 90%		
r ersonar protective equipment	Yes			protective clothing, face shield		
Name of contributing scenario Use of substances at small scale laboratory (< 1 l or kg present at workplace). Larger laboratories and R+D installations should be treated as industrial processes Use descriptor covered PROC 15			nall scale laboratory (< 1 l or 1 e). Larger laboratories and ld be treated as industrial			

Product characteristic					
Physical state	r	The substance is a liquid at the process temperatu			
Vapour pressure		Vapour pressure at 20°C is 8*10 ⁻⁸ Pa. The substance is regarded as a low volatility substance ¹			
Concentration of substance	-	100 %			
Amounts used					
Not relevant					
Frequency and duration of use/exposure					
Duration of exposure		1-4	hours/day		
Frequency of exposure	-	≤ 240	days/year		
Human factors not influenced by risk ma	anagement				
Other given operational conditions affec	ting workers	exposure			
Location	-	Indoor			
Domain		Industrial			
Technical conditions and measures at process level (source) to prevent release					
None					
Technical conditions and measures to co	ntrol dispersi	on from source towa	rds the worker		
Local exhaust ventilation required	No				
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to pers	onal protection	on, hygiene and healt	h evaluation		
Respiratory protection required	No				
Personal protective equipment	Yes	protective gloves: 90 Protective clothing,	0% eye protection		

¹According to "Guidance on Information requirements" R7a, p 269: "Some physico-chemical properties of the substance or mixture could be the basis for waiving testing. In particular, it should be considered for low volatility substances, which are defined as having Vp < 1*10-5 kPa (= 7,5*10-5 mmHg) for indoor use and Vp < 1*10-4 kPa (= 7,5*10-4 mmHg) for outdoor use."

2.2 Environment

Contributing Scenario controlling environmental exposure	ERC1
Amounts used	1000 tonnes per year
Release times per year	40 days
Environmental factors not influenced by risk management	River flow rate: 18000 m3/day
Other given operational conditions affecting environmental exposure	release to: air: 0.0001%, water: 0.03%, soil: 0.01%; fraction used at main source: 100%; fraction tonnage to region: 100%
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	spERC: Modified ESVOC 1.1.v1to use less manufacturing days. STP; No sludge to soil
Conditions and measures related to municipal sewage treatment plant	Sewage treatment plant discharge: 2000000 L/day

3. Exposure scenario: Formulation (ES2)

3.1 Workers

Formulation is carried out in a closed batch process.

Reference number	ES 2			
Free short title	Industrial formulation			
Systematic title based on use descriptor	Batch wise formulation (PROC 3; PROC 8b; PROC 15)			
Processes, tasks, activities covered	 Charging from storage tanks in enclosed system (PROC 3) Charging from IBC containers (PROC 8b) Industrial formulation of mixtures (PROC 3) Sampling (PROC 3) Packaging of formulation at dedicated facility (PROC 8b) Cleaning of the process equipment in closed systems (PROC 3) Disposal of waste product & used containers (PROC 8b) QC laboratory (PROC 15) 			
Environment characteristic covered	ERC 2: Formulation			
Assessment Method	ECETOC TRA Worker v2.0 TGD Excel			
Name of contributing scenario	Batch manufacture of a chemical or formulation where the predominant handling is in a contained manner			
Use descriptor covered	PROC 3	PROC 3		
Processes, tasks activities covered	 Charging from storage tanks in enclosed system Industrial formulation of mixtures Sampling Cleaning of the process equipment in closed systems 			
Product characteristic				
Physical state	The substance is a liquid at the	e process temperatures.		
Vapour pressure	Vapour pressure at 20°C is $8*10^{\circ}$ Pa. The substance is regarded as a low volatility substance ¹			
Concentration of substance	100 %			
Amounts used				
Not relevant				
Frequency and duration of use/exposure				
Duration of exposure	>4	hours/day		
Frequency of exposure	\leq 240 days/year			
Human factors not influenced by risk manag	gement			
The work performed is of light character, resulting in a default respiration volume on 10m ³ /8h shift.				
Other given operational conditions affecting	workers exposure			
Location	Indoors			
Domain	Industrial			
Technical conditions and measures at process level (source) to prevent release				

Enclosed system. LEV at transfer points.						
Technical conditions and measure	Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation required		No				
Organisational measures to prevent /limit releases, dispersion and exposure						
-						
Conditions and measures related to personal protection, hygiene and health evaluation					n evaluation	
Respiratory protection required	No					
Personal protective equipment	Yes		Chemical resistant gloves: 90%			
			1	0,0,00		
Name of contributing scenario		Tran vesse	sfer els/la	of substance or preparation of substance or preparation of the substance o	ration (charging) from icated facilities.	
Use descriptor covered		PRC)C 8	b G IDC i		
Processes, tasks activities covered		Char Disp	ging osal	of waste product & u	sed containers	
		Fillir	ng of	f bulk transport		
		Fillir	ng of	f IBC containers		
Assessment Method		ECE	TOC	TTRA Worker v2.0		
Product characteristic						
Physical state The substance is a liquid at the process temperatures.			process temperatures.			
Vapour pressure		Vapour pressure at 20°C is 8*10 ⁻⁸ Pa.				
In the substance is reConcentration of substance100 %			tance is regarded as a	low volatility substance'.		
Amounts used						
Not relevant						
Frequency and duration of use/exposure						
Duration of exposure >4 h/day			h/day			
Frequency of exposure	sure \leq		0		days/year	
Human factors not influenced by risk management						
The work performed is of light char	acter, result	ing in a	a def	fault respiration volun	ne on 10m ³ /8h shift.	
Other given operational condition	s affecting	worke	ers e	xposure		
Location		Indo	ors/C	Dutdoors		
Domain		Industrial				
Technical conditions and measure	es at proces	s level	(sou	arce) to prevent relea	ase	
None						
Technical conditions and measures to control dispersion from source towards the worker						
Local exhaust ventilation required No						
Organisational measures to preve	nt /limit rel	eases,	disp	persion and exposure	2	
-						
Conditions and measures related to personal protection, hygiene and health evaluation				n evaluation		
Respiratory protection required	No					
Personal protective equipment	Ye	Yes		Chemical resistant g protective clothing, g	loves: 90% goggles	
				_ 0,0		

Name of contributing scenario	U: pr in	Use of substances at small scale laboratory (< 1 l or 1 kg present at workplace). Larger laboratories and R+D installations should be treated as industrial processes			
Use descriptor covered	PI	PROC 15			
Assessment Method	E	ECETOC TRA Worker v2.0			
Product characteristic					
Physical state	Tl	The substance is a liquid at the process temperatures.			
Vapour pressure	Va Tl	Vapour pressure at 20°C is 8*10 ⁻⁸ Pa. The substance is regarded as a low volatility substance ¹ .			
Concentration of substance	10	00 %			
Amounts used	·				
Not relevant					
Frequency and duration of use/exposure					
Duration of exposure	1-	1-4		hours/day	
Frequency of exposure	\leq	240		days/year	
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Location Indoor					
Domain Industrial					
Technical conditions and measures at pro-	ocess lev	vel (sou	urce) to prevent relea	ase	
None					
Technical conditions and measures to con	ntrol dis	spersio	n from source towar	ds the worker	
Local exhaust ventilation required	No				
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to personal protection, hygiene and health evaluation					
Respiratory protection required	No				
Personal protective equipment	Yes		protective gloves: 90 Protective clothing)%	

¹According to "Guidance on Information requirements" R7a, p 269: "Some physico-chemical properties of the substance or mixture could be the basis for waiving testing. In particular, it should be considered for low volatility substances, which are defined as having Vp < $1*10^{-5}$ kPa (= 7,5*10⁻⁵ mmHg) for indoor use and Vp < $1*10^{-4}$ kPa (= 7,5*10⁻⁴ mmHg) for outdoor use."

3.2 Environment

Contributing Scenario controlling environmental exposure	ERC1
Amounts used	1000 tonnes per year
Release times per year	300 days
Environmental factors not influenced by risk management	River flow rate: 18000 m3/day
Other given operational conditions affecting environmental exposure	release to: air: 0.25%, water: 0.02%, soil: 0.01%; fraction used at main source: 100%; fraction tonnage to region: 100%

Technical onsite conditions and measures to reduce or	spERC: Modified ESVOC 2.2.v1
limit discharges, air emissions and releases to soil	STP; No application of sludge to soil
Conditions and measures related to municipal sewage treatment plant	Sewage treatment plant discharge: 2000000 L/day

4. Exposure scenario: Use as an intermediate (ES3)

4.1 Workers

Table 4: Description of ES 3

Reference number	ES 3		
Free short title	Use of intermediates		
Systematic title based on use descriptor	Batch manufacture of a chemical where the predominant handling is in a contained manner, e.g. through enclosed transfers, but where some opportunity for contact with chemicals occurs, e.g. through sampling. (PROC 3, 8b, 15)		
Processes, tasks, activities covered	 PROC 3: Industrial manufacture of chemical substances, including cleaning of the equipment. PROC 8b: Transfer of substance or preparation (charging) to vessels/large containers at dedicated facilities. PROC 15: QC Laboratory 		
Environment characteristic covered	ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)		
Name of contributing scenario	Batch manufacture of a chemical or formulation where the predominant handling is in a contained manner		
Use descriptor covered	PROC 3		
Processes, tasks activities covered	 Industrial manufacture of ch Sampling Charging to storage tanks in 	nemical substances	
	4. Cleaning of the process equ	ipment in closed systems.	
Product characteristic			
Physical state	The substance is a liquid at the process temperatures.		
Vapour pressure	Vapour pressure at 20°C is 8*10 ⁻⁸ Pa.		
Concentration of substance	The substance is regarded as a low volatility substance ¹ .		
Amounts used			
Amounts used			
Frequency and duration of use/exposure			
Duration of exposure	>4 hours/day		
Frequency of exposure	≤ 240 days/year		
Human factors not influenced by risk management			
The work performed is of light character, resulting in a default respiration volume on 10m ³ /8h shift.			
Other given operational conditions affecting workers exposure			
Location	Indoors		
Domain	Industrial		
Technical conditions and measures at proces	s level (source) to prevent rele	ase	
Enclosed transfers. Sampling with LEV. Spill c	ontainment at all input/output po	pints.	

Technical conditions and measures to control dispersion from source towards the worker						
Local exhaust ventilation required No						
Organisational measures to prevent /limit releases, dispersion and exposure						
-						
Conditions and measures related	to perso	onal	prote	ctio	n, hygiene and health	n evaluation
Respiratory protection required	No					
Personal protective equipment	Vac			Chemical resistant gloves: 90%		
r ersonar protective equipment	Y es			protective clothing, eye protection		
Name of contributing scenario	of contributing scenario		Packaging of chemical substances into bulk transport, IBC			
		containers or drums.				
Use descriptor covered Processes, tasks activities covered			PROC 8b Charging from IBC containers			
			Disp	osal	of waste product & u	sed containers.
			Fillin Fillin	ig of	f bulk transport	
			Fillin	ig 0: 1g 0:	f drums	
Product characteristic						
Physical state			The s	The substance is a liquid at the process temperatures.		
vapour pressure			Vapo The s	subs	tance is regarded as a	low volatility substance ¹ .
Concentration of substance			100 9	100 %		
Amounts used						
Not relevant						
Frequency and duration of use/ex	posure					
Duration of exposure		>4 h/day		h/day		
Frequency of exposure		\leq 240			days/year	
Human factors not influenced by	risk ma	nag	ement			
The work performed is of light characteristics of light characteristics of light characteristics of the second sec	acter, re	sulti	ing in a	a de	fault respiration volur	ne on 10m ³ /8h shift.
Other given operational condition	s affect	ing	worke	rs e	xposure	
Location		Indoors/Outdoors				
Domain		Industrial				
Technical conditions and measure	s at pro	ocess	s level	(soi	urce) to prevent relea	ase
None						
Technical conditions and measures to control dispersion from source towards the worker						
Local exhaust ventilation required No						
Organisational measures to prevent /limit releases, dispersion and exposure						
-						
Conditions and measures related to personal protection, hygiene and health evaluation						
Respiratory protection required	No					
Personal protective equipment	Yes			Chemical resistant gloves: 90%		
protective equipment res protective clothing, goggles				goggles		
			Use	of s	ubstances at small sca	le laboratory (< 1 1 or 1 kg
Name of contributing scenario			present at workplace). Larger laboratories and R+D			
		Installations should be treated as industrial processes				
Use descriptor covered						
Assessment Method		ECETOC TRA Worker v2.0				

Product characteristic					
Physical state		The substance is a liquid at the process temperatures.		e process temperatures.	
Vapour pressure		Vapour pressure at 20°C is 8*10 ⁻⁸ Pa.			
	Tł		The substance is regarded as a low volatility substance ¹ .		
Concentration of substance		100 %			
Amounts used					
Not relevant					
Frequency and duration of use/exposure					
Duration of exposure		1-4		hours/day	
Frequency of exposure	≤ 240			days/year	
Human factors not influenced by risk management					
Other given operational conditions affecting workers exposure					
Location	Indoor				
Domain	main Industr		rial		
Technical conditions and measures at process level (source) to prevent release					
None					
Technical conditions and measures to con	ntrol	dispersio	on from source towar	rds the worker	
Local exhaust ventilation required	No	No			
Organisational measures to prevent /limit releases, dispersion and exposure					
Conditions and measures related to perso	onal	protectio	n, hygiene and healtl	h evaluation	
Respiratory protection required	No				
Personal protective equipment	Ve	2	protective gloves: 90)%	
i ersonar protective equipment		,	Protective clothing,	eye protection	

¹According to "Guidance on Information requirements" R7a, p 269: "Some physico-chemical properties of the substance or mixture could be the basis for waiving testing. In particular, it should be considered for low volatility substances, which are defined as having Vp < $1*10^{-5}$ kPa (= 7,5*10⁻⁵ mmHg) for indoor use and Vp < $1*10^{-4}$ kPa (= 7,5*10⁻⁴ mmHg) for outdoor use."

4.2 Environment

Amounts used	1000 tonnes per year
Release times per year	300 days
Environmental factors not influenced by risk management	River flow rate: 18000 m3/day
Other given operational conditions affecting environmental exposure	release to: air: 0.0000%, water: 0.03%, soil: 0.1%; fraction used at main source: 100%; fraction tonnage to region: 100%
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	spERC: ESVOC 6.1a.v1 STP; No sludge to soil
Conditions and measures related to municipal sewage treatment plant	Sewage treatment plant discharge: 2000000 L/day