"KIRIM TİTAN" ÖZEL ANONİM ŞİRKETİ

Severnaya Promzona, Armyansk şehri, Kırım Özerk Cumhuriyeti, Ukrayna 96012 Tel. & Fax: (06567) 3-12-60, 3-74-44 Sicil Numarası: 32785994

03.06.2013 No: 18901

LİMTEKS İTHALAT İHRACAT DANIŞMANLIK MÜMESSİLLİK TİC.LTD.STİ.

İşbu yazımızla, Limteks İthalat İhracat Danışmanlık Mümessillik Tic. Ltd. Şirketinin 27Mayıs 2013 tarihinde, Armyansk şehri, Kırım Özerk Cumhuriyeti, Ukrayna'da bulunan "KIRIM TİTAN" Özel Anonim Şirketi ile işbirliği Sözleşmesi imzaladığını teyit ederiz.

LİMTEKS şirketine, Türkiye ve Orta Doğu bölgesinde "KIRIM TİTAN" fabrikası tarafından üretilen ürünlerin dağıtım yapma hakkı verilmiştir.

"KIRIM TİTAN" fabrikası adına LİMTEKS şirketi, aşağıda listesi bulunan ürünlere ilişkin yıllık kontrat teklif etmektedir:

- ALÜMİNYUM SÜLFAT TEKNİK, SAF (GRANÜL HALİNDE)
- DEMİR SÜLFAT HEPTAHİDRAT, SANAYİ KULLANIMI İÇİN
- SÜLFÜRİK ASİT, TEKNİK KULLANIMI İÇİN

İlgilendiğiniz ürünün hacmi ve fiyatı, LİMTEKS tarafından söz konusu bölge için rezerve edilen yıllık hacimlerine bağlı olarak LİMTEKS tarafından belirlenecektir.

"KIRIM TİTAN" fabrikası, LİMTEKS tarafından talep edilen ürün hacminin üretimini, kalitesini ve sevkiyatın zamanında yapılacağını garanti eder.

Dış Ticaret Departmanı Baş Mütehassısı:

/imza,kaşe/

Nimatullayev A.Y.

Minakov Ruslan

Çelik Özbilek

O. Cenk Ataman

REACH Registration Certificate



This document certifies that the non-EU manufacturer

CRIMEA TITAN PJSC

Severnaya Promzona * 96012 ARMYANSK * UKRAINE

Has successfully completed the registration of the following substance in accordance with the REACH Regulation (EC) № 1907/2006

Aluminium Sulphate; EC: 233-135-0 CAS: 10043-01-3

01-2119531538-36-0065	
100 - 1.000 mt	
Full Registration	
OSTCHEM Germany GmbH Erdmannstr. 10 22765 Hamburg Germany	

Date of issue: 01 July 2013

Issued by: OSTCHEM Germany GmbH

Authorized Signature:

OSTCHEM Germany Gmail: Sitz: Hamburg, Amtsgericht Hamburg, H98 87945 - Geschäftshihrer: Matthäus Ebinal Steuernummer, 041/748/02616: Umsatzsteuer-la-Nr.: DE814385062

№ 5615

IRON (II) SULFATE TECHNICAL

ЖЕЛЕЗА (П) СУЛЬФАТ ТЕХНИЧЕСКИЙ

TУ У 24.1-32785994-007:2008 Марка А TU U 24.1-32785994-007:2008 Mark А Пожаро-взрывобезопасен / FireProof and explosion-proof.

Масса нетто 22

Номер партии 00063

Дата изготовления 06.05.2013

Date of manufacture

Net weight Number of lot Количество единиц упаковок в партии - Контейнер 1000 кт "биг-бег" - 22

Quantity of units sacked in lot

Вид транспорта авт.- ВС 5851 АІ прицеп- ВС 4351 ХХ

Type of crate

Контрактодержатель

Contract holder

Грузополучатель

Consignee

Наименование показателей	Норма по ТУ У	Результат испытаний
Name of index	Norms on TU U	Results of test
1. Внешний вид.	Кристаллы серого цвета с желто-зеленым оттенком	Соответствует
(Appearance.)		
2. Массовая доля сульфата железа (FeSO4),%, не менее	54	63
(Mass fraction of iron sulfate (FeSO4), %, min)		
в пересчете на Fe, %	20	23
3. Массовая доля свободной серной кислоты в пересчете на H2SO4, %, не более	0,3	отсут
(Mass fraction of free sulfuric acid as H2SO4, %, max)		
4. Массовая доля нерастворимых в воде веществ, %, не более	0,5	0,1
(Mass fraction of water-insoluble residue, %, max)		
5. Массовая доля частиц размером больше 0,5 мм, %, не более	12	5
(Mass fraction of particles sized more than 0,5 mm, %, max)		

Продукт соответствует ТУ У 24.1-32785994-007:2008 Марка А

The product conforms to TU U 24.1-32785994-007:2008 Mark A

Начальник ОТК Head of Technical Department А.А.Станишевская A.A.Stanishevskaya

Мастер смены ОТК

10.06.2013

Nº 5614

IRON SULFATE HEPTAHUDRATE

КУПОРОС ЖЕЛЕЗНЫЙ НЕОСУШЕННЫЙ

ТУ У 24.1-32785994-008:2010 TU U 24.1-32785994-008:2010 Пожаро-взрывобезопасен / FireProof and explosion-proof.

Масса нетто 60

Номер партии 00104

Дата изготовления 31.05.2013

Date of manufacture

Net weight

Number of lot

Количество единиц упаковок в партии - Контейнер 600 кг "биг-бег" - 78

Quantity of units sacked in lot

Вид транспорта Жд. - 65772386

Type of crate

Контрактодержатель

Contract holder

Грузополучатель

Consignee

Наименование показателей	Норма по ТУ У	Результат испытаний
· Name of index	Norms on TU	Results of test
1. Внешний вид	Кристаллы от зеленовато-голу бого до желто-коричне вого цяета	соответствует
(Appearance:)		
2. Массовая доля сульфата железа (II), %, не менее	49	51
(Mass portion of sulfuric iron (FeSO4), %, min)		
3. Массовая доля свободной серной кислоты в пересчете на H2SO4, %, не более (Mass portion of available sulfuric acid H2SO4, %, max)	3	0,3
4. Массовая доля нерастворимых в воде веществ, %, не более	0,2	0,1
(Mass portion of insoluble residue, %, max)		
5. Массовая доля гигроскопической (свободной) воды, %, не более (Mass fraction of hygroscopic (free) water, %, max)	5	3

Продукт соответствует ТУ У 24.1-32785994-008:2010

The product corresponds to TU U 24.1-32785994-008:2010

Начальник ОТК Head of Technical Department А.А.Станишевская A.A.Stanishevskaya

Мастер смены ОТК

10.06.2013

according to Regulation (EC) No. 1907/2006 (REACH) and Commission Regulation (EU) No 453/2010





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1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

.1 Product identifier	
Substance name	Iron Sulphate
Trade name	Iron(II) sulfate technical types: Iron Sulphate Heptahydrate, Green vitriol technical, Green vitriol non-dried; Iron Sulphate Tetrahydrate, Iron(II) Sulphate technical, Iron (II) Sulfate technical
IUPAC name	Iron(2+) sulfate
ES#	231-753-5
CAS#	7720-78-7
Molecular formula	Fe.H2O4S • nH2O
This substance is classified acc	ording to the Annex I of Directive 67/548/EEC and Annex VI of Regulation (EC) No 1272/2008
REACH registration No	01-2119513203-57-0012

1.2 Relevant identified uses of	the substance or mixture and uses advised against
Identified uses	Treatment of raw water in the supply of either potable water or industrial process water. Treating waste water and in sludge treatment at waste water treatment plants (WWTPs). In biogas production. Reactive products/precursors e.g. in manufacture of pigments and other iron compounds, also including use as catalyst. Reducing Cr (VI) content in cement. Land remediation applications Laboratory chemical Agrochemicals In adhesives and sealants In machine-building industry — for neutralization of sulphuric acid in electrolyte production. 7-hydrate of iron sulfate is planned to be used for iron sulfate (III) production.
Uses advised against	none

.3 Details of the supplier of t	
Manufacturer	Crimea Titan PJSC Address: Severnaya Promzona, Armyansk, AR Crimea, Ukraine, 96012
Only representative	OSTCHEM Germany GmbH» Hamburg, Erdmannstr. 10, Germany, 22765 Irene Nasdala tel. +49 40 5 300 300 (working time only)

according to Regulation (EC) No. 1907/2006 (REACH) and Commission Regulation (EU) No 453/2010



Iron (II) sulphate technical

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	fax: +49 40 5 300 30 33
	e-mail: nasdala@afkem.com
Responsible person	Andriy Gonchar – Head of R&D Department
	Address: Severnaya Promzona, Armyansk, AR Crimea,
	Ukraine, 96012
	Tel: +38 06567 3 73 79 (working time only)
	E-mail: unauka3@titanexport.com
.4 Emergency telephone nu	mber
+38 06567 3 75 35 (twenty-fi	our-hour)

2. HAZARDS IDENTIFICATION

(A)

2.1. Classification of the substance	
Iron Sulphate, Iron Sulphate techni	cal (Iron Sulphate Tetrahydrate, Iron (II) Sulphate
technical, Iron Sulphate Heptahydrate.	
Substance classification according to Reg	gulation (EC) No 1272/2008 [CLP/GHS]
Hazard Class and Category Code	Acute Tox. 4
	Eye Irrit. 2
	Skin Irrit. 2
Hazard Statement	H302

	H315
	H319
Substance classification according to Dire	
Hazard symbol	Xn
Time and Symbol	All
	Xi
Risk phrases	R22, R36/38
Safety advice appearing	S26, S37/39, S46, S60
	\$26 \$29 \$26/27/20 \$46 \$60 (aply for Iron
	S26, S28, S36/37/39, S46, S60 (only for Iron
	Sulphate Heptahydrate or Green vitriol technical)
Additional information	(cermical)
Full text of R- H-phrases see section 16	
Human Heath effects	
Inhalation	High concentration of dust in the air may cause
	cough and irritation of nose and respiratory tract.
Eyes effect	Irritation of the eyes felt for long time is likely
	to appear.

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006 (REACH)
and Commission Regulation (EU) No 453/2010



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Skin effect	Slight irritation of the skin is likely to appear.
	Swallowing of small amount is do not cause toxic effect.
Swallowing	Swallowing a large amount leads to nausea, vomiting, diarrhea, drop of blood pressure. Upon absorption of large doses cardiovascular disturbances and toxic action towards liver and kidneys follow.

2.2 Label elements			
Product identifier	Iron Sulphate Tetrahydrate (Iron (II) Sulphate technical) Index # none Iron Sulphate Heptahydrate (Green vitriol technical) Index # 026-003-00-7		
Hazard pictograms	GHS07: exclamation mark		
Signal word	Warning		
Hazard statements	H302: Harmful if swallowed. H315: Causes skin irritation. H319: Causes serious eye irritation		
Precautionary statements	P280: Wear protective gloves/protective clothing/eye protection/face protection. P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. P302+P352: IF ON SKIN: Wash with plenty of soap and water. P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310: Immediately call a POISON CENTER or doctor/physician. P501: Dispose of contents/container to an approved waste disposal plant.		

according to Regulation (EC) No. 1907/2006 (REACH) and Commission Regulation (EU) No 453/2010

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2.3 Other hazards

Iron sulphate is neither a PBT nor a vPvB substance.

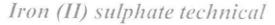
3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances			
Chemical name	EINECS #	CAS #	Concentration, range % (w/w)
Iron Sulphate Tetrahydr	ate (Iron (II) Sulpha	te technical)	
Iron sulphate tetrahydrate		20908-72-9	85 - <100
Magnesium sulphate	231-298-2	7487-88-9	0 - 5
Calcium sulfate	231-900-3	7778-18-9	0 - 5
Iron Sulphate Heptahydi	ate (Green vitriol te	chnical)	,
Iron sulphate heptahydrate	231-753-5	7782-63-0	85 - <100
Magnesium sulphate	231-298-2	7487-88-9	0 - 5
Free sulphuric acid	231-639-5	7664-93-9	0 - 2
Free water	231-791-2	7732-18-5	0 - 5

4. FIRST AID MEASURES

4.1. Description of first aid mea	sures		
General informations	Provide rest, warm conditions, comfort position, fresh air availability.		
4.2. Most important symptoms	and effects, both acute and delayed		
In case of inhalation	Take out to fresh air. If breathing is difficult, provide oxygen; if not breathing, give artificial respiration.		
In case of eye contact	Flush eyes with running water until irritation ceases. If irritation continues, get medical attention.		
In case of skin contact	Remove contaminated clothing, shoes and outfit. Flush t contaminated skin with plenty of water using soft soap un the skin is cleaned.		
In case of ingestion	Do not induce vomiting. Give to drink plenty of water, give charcoal. Get medical aid immediately.		
Information to physician	Treat symptomatically and supportively.		
First aid arsenal Universal medical kit with a set of drugs (in consulta with the medical department of the enterprise.			
4.3 Indication of any immediate	medical attention and special treatment needed		
Immediate first aid attention is no	t expected		

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5. FIREFIGHTING MEASURES

TIKEFIGHTING MEASURES		
Use any means suitable for extinguishing surrounding fire.		
ing None		
om the substance or mixture		
Sulphur and iron oxides		
As in any fire, wear a self-contained breathing apparatus in pressure demand, MSHA/NIOSH (approved or equivalent), and full protective gear.		
Non-flammable, non-explosive, see section 9.		
9		
riate for surrounding fire.		

6. ACCIDENTAL RELEASE MEASURES.

6.1. Personal precautions, prot	ective equipment and emergency procedures
Personal precautions	Avoid direct contact with the substance and inhalation of aerosol particles. Use personal protection means as stated in the section 8.
Emergency procedures	If spilled, immediately contain the spilled substance. Ventilate area and wash spill site after material pickup is complete.
6.2. Environmental precaution	s ·
As a matter of good practice, mi systems, or bodies of water.	nimize contamination of sewage water, soil, groundwater, drainage
6.3. Methods and material for	containment and cleaning up
Pick up and place in a suitable of generate dust.	container for reclamation or disposal, using a method that does not
6.4. Reference to other sections	
Information about personal precaution Information about waste disposal - see	ns - see Section 8. e Section 13.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling	
Precautions for safe handling	Avoid contact with skin and eyes. If exposed, wash to avoid mechanical irritation and soiling. Use scrubbers for collecting and purifying acid gases.

according to Regulation (EC) No. 1907/2006 (REACH) and Commission Regulation (EU) No 453/2010

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Fire preventions	None, as product has no flammable properties. See section 5.
Aerosol and dust generation preventions	Use local exhaust ventilation or other appropriate engineering controls to maintain exposures below occupational exposure limit
Electrostatics prevention	As a matter of good prastice take measures to prevent the build up of electrostatic charge, such as ensuring all equipment is electrically grounded.
Safe transporting	Adhere to the rules on the transport of goods, which operate for the appropriate type of transport. Not violate the integrity of container. During loading works execute instructions and rules for the appropriate works.
Advice on general occupational hygiene	Do not eat, drink and smoke in work areas, wash hands after use, remove contaminated clothing and protective equipment before entering eating areas.
7.2. Conditions for safe storage, incl	uding any incompatibilities
Technical measures and storage conditions	Store in manufacturer's package in cool and dry area where it is safe from contamination and exposure to rain, snow and subsoil water.
Packaging materials	Package should exclude moisture penetration and guarantee the safety of the product during transportation and storage.
Requirements for storage rooms and vessels	Special requirements for storage structures are not established. The product is to be stored at room temperature and normal humidity environment.
7.3. Specific end use(s)	
none	

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Contro	ol parameters				
Occupation	onal exposure lin	nits			
Chemical	Name	Country		OEL	
Iron (II) su	V.			$TLV = 6 \text{ mg/m}^3$ $TWA = 2 \text{ mg/m}^3$	
DNEL/DM	IEL values:				
	DNEL/DN	MEL			
Worker		Exposure route	Exposure frequency	Remark	
Industry	y Professional Consumer				
		0.29 mg/kg bw/day	oral	long-term	

according to Regulation (EC) No. 1907/2006 (REACH) and Commission Regulation (EU) No 453/2010

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	0.57 mg/kg bw/day	0.29 mg	g/kg bw/day	dermal	long-term	
	2.01 mg/m3	0.50 mg	g/m3	inhalation	long-term	
PNEC va	lues:					
	PNEC					
	Worker		C	Exposure route	Exposure frequency	Remark
Industry	Professional		Consumer			
	PNEC = 55 mg/kg c	lw		soil		
	PNEC = 49.5mg Fe/	kg dw		sediment		
8.2 Expos	sure controls					
Occupati	onal exposure contr	ols				
Approp	riate engineering co	ntrols	production substance	facilities. Storage processing area ar		ig in the
Respiratory protection			Use dust respirator according to the EN149 equipped with the dust recovery filter according to the EN 143.			
Eye/face	protection			ear dust-proof glasses according to the EN166.		
Skin pro	otection				npermeable protective coat, apron and union	
General hygiene considerations			Emergency eyewash and safety shower should be in close proximity as a matter of good practice. Wash hands and face thoroughly with mild soap before eating and drinking.			
Environn	nental exposure cont	rols				
Measures to prevent exposure		The main pollutant is the iron sulfate (II) aerosol. Prevent the entering of the substance into water sources, wastewaters and the soil. The substance half-life – 7-1 days (stable).			irces,	
Consume	r exposure controls					
Measure of the sub	es related to consur stance	ner use	s Additiona	l measures are not	required.	

9. PHYSICAL AND CHEMICAL PROPERTIES.

9.1. Information on basic physica	l and chemical properties
Appearance	Solid, grey with yellow-green hue crystalline powder
Odour	Odourless
Odour threshold	Not applicable
рН	3,7 (10 % water solution) - for anhydrous form
Melting point/range (°C)	480 (anhydrous, decomposes)
Initial boiling point/range (°C)	300 (hydrates decompose) heptahydrate
Flash point (°C)	not applicable
Evaporation rate	not applicable
Flammability	not applicable

according to Regulation (EC) No. 1907/2006 (REACH) and Commission Regulation (EU) No 453/2010





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Upper/lower flammability or explosive limits	not applicable		
Vapour pressure	does not need to be conducted, because the melting point is above 300°C.		
Vapour density	not applicable		
Relative density	3.65 D25 - anhydrous form 2.97- heptahydrate		
Water solubility (20°C in g/l)	228 g/l at 25°C - anhydrous form 156.5 g/l (cold)- heptahydrate		
Partition coefficient n-	In accordance with Column 2 of REACH Annex VII, does		
Octanol/Water (log Po/w)	not need to be conducted as the substance is inorganic.		
Auto-ignition temperature (°C)	not applicable		
Decomposition temperature (°C)	not applicable		
Viscosity	not applicable		
Explosive properties	not applicable		
Oxidising properties	Will oxidize in air especially in the presence of another acid substance		
9.2 Other information			
No other information			

10. STABILITY AND REACTIVITY

201021	DIETT AND REACTIVITY
10.1 Reactivity	Not reactive under regular storage and use conditions.
10.2 Chemical stability	The product appears to be stable under regular storage and use conditions.
10.3 Possibility of hazardous reactions	No hazardous reactions
10.4 Conditions to avoid	Light, dust, moisture, excess heat, continuous exposure to air.
10.5 Incompatible materials	Heptahydrate – strong acids, alkalies, organic compounds. Anhydrous form – strong acids, alkilies, soluble carbonates, gold and silver salts, lead acetate, limewater, potassium iodide, potassium and sodium tartrate, tannin, herbal astringent tinctures and decoctions.
10.6 Hazardous decomposition products	None

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological e	ffects.
Toxicokinetics, metabolism and dis	tribution
Non-human toxikological data	
Human toxikological data	Iron is an essential element, and plays an important role in

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biological processes, and iron homeostasis (biochemical
mechanisms maintaining constant concentration in the cell)
is under strict control.
This water soluble inorganic iron salt do not undergo
metabolism per se. As already mentioned iron is bound to
transferring for transport to the bone marrow or contained
within storage forms.
About 1 mg of iron is lost each day through sloughing of
cells from skin and mucosal surfaces, including the lining
of the gastrointestinal tract.
No physiological mechanism of iron excretion exists.
Consequently, absorption alone regulates body iron stores

Acute toxicity

The overall pattern of acute oral toxicity for iron salts is that they are harmful if swallowed, with an oral lethal dose in rats of 500-2000 mg/kg bw and approximately 1000 mg/kg bw for humans. There is limited evidence that inhaled soluble iron salts do not impair lung function, and that the dermal lethal dose would be greater than 2000 mg/kg.

Exposure	Value	Ex	posure time period	Species	Method		
oral	LD50 > 2000 mg/kg bw	acute		rat	OECD TG 401 and GLP		
oral	LD50 = 1000 mg/kg bw	acute		human	according to EU Directive 93/21/EEC		
			Skin		irritant		
			Eye		irritant		
Irritation			Respiratory	tract	not irritant		
				Ferrous sulfate is skin irritant based on (2:1 animals majority) in rabbit test and is eye irritant.			
Respiratory or skin sensitisation			Not sensitizing Results of a reliable LLNA test were clearly negative for ferrous sulfate heptahydrate.				
Germ cell mutagenicity			Not genotoxic				
Carcinogenicity			and increased risk type II diabetes an and do not provide	ssociations of chronic d cancer o convincir	rrogenic s between high iron intake and/or stores diseases such as cardiovascular disease, f the gastrointestinal tract are conflicting ag evidence of a causal relationship and such chronic diseases.		
			NOAEL = 1000 mg/kg body weight/day In humans, iron supplementation of about 5.8 to 11.7 mg/kg bw/da/ (for a 60kg individual) is routinely prescribed throughout pregnancy with no adverse effects on pregnancy outcome. Evidence of adverse				

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		effects on male testes has only be doses, at which some of the expe		
STOT-single exposure		No data available		
Repeate	d dose toxicity			
Exposure	Value	Exposure time period	Species	Method
oral	NOAEL >11.5 mg/kg/day	61 days	Rat	Appel et al., 2001
STOT-repeated exposure		No data available		

12.1. T	oxicity				
	Aqu	atic toxicity	Effect dose	Exposure time	Species
Acute	toxicity	to fish	LC50 = 46.6 mg/L	96 h	Oryzias latipes
Acute nvertel		to aquatic	EC50 = 19.0 mg/L	48 h	Daphnia magna
Acute	toxicity	to aglae	EC50 = 6.9 mg/L	72 h	Selenastrum capricornutum
2.2 Pe	rsisten	ee and degradabi	lity		
Abiotic	Degra	dation			
Half- time	Method		Rei	nark	5
		In natural ecosy	stems the absence of o	xygen or low	pH can result in iron sal

time	Method	Remark
		In natural ecosystems the absence of oxygen or low pH can result in iron salts remaining in solution but under such conditions environmental effects would be strongly influenced by these parameters. The presence of other ions in solution, such as carbonates and humates, is expected to stabilize ferrous but this is not expected to be a sufficient effect to overcome the precipitation.

Biodegradation	**	In effect, ferrous and ferric ions can be treated together, because the ferrous ion is rapidly transformed to ferric ion under the conditions found at typical points of release. Ferric ions released into (or generated in) water will rapidly precipitate as highly insoluble oxides and oxo-hydroxides. These stable compounds are exactly the forms in which iron is found naturally in the earth's crust.
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12.3 Bioaccumulative potential

The available data on iron concentrations in the environment show the way that organisms display adaptation to the high background concentrations of iron.

12.4 Mobility in soil

In surface impoundments Fe++ may transit to Fe+++, which is accompanied by absorption of the dissolved oxygen.

Will transform in the environment into ferric salts (trivalent) (basic iron sulfate, iron sulfate, iron sulfate monohydrate, diiron trisulfate).

12.5 Results of PBT and vPvB assessment

according to Regulation (EC) No. 1907/2006 (REACH) and Commission Regulation (EU) No 453/2010





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The substance is not PBT or vPvB.	
12.6 Other adverse effects:	
none	

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods	
Appropriate disposal / Product	Waste disposal in strict correspondence with the state and local laws and regulations.
Waste codes / waste designation	None, waste is not classified as hazardous according to the
according to EWC / AVV	Commission Decision 2000/532/EC
Appropriate disposal /Packaging	Dispose of container and unused contents in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

14.1. UN number	Not applicable	
14.2. UN proper shipping name	Not applicable	
14.3. Transport hazard class(es)	Not applicable	
14.4. Packing group	Not applicable	
14.5. Environmental hazards	Not applicable	
14.6. Special precautions for user	Not applicable	
14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code		
14.8 Additional information	The product is transported by railway (RID), road (ADR), and sea (IMDG) transport. The cargo is classified as non-hazardous in compliance with the international rules of carriage. Obligatory mark «Keep dry».	

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the sub	stance
EU regulation	
This product is classified according to the:	
Directive 67/548/EEC	
Directive 1999/45/EC	
Regulation (EC) No 1272/2008	
15.2 Chemical Safety Assessment	
A chemical safety assessment has been carried out for the iron (II)sulphate	

16. OTHER INFORMATION

27			
R	elevant R-, H-, EUH-phrases	Hazard symbol:	
	A	A	

according to Regulation (EC) No. 1907/2006 (REACH) and Commission Regulation (EU) No 453/2010

Iron (II) sulphate technical



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Xn: Harmful
ZII. I IIIIIIIII
Xi: Irritant
R – phrases:
R22: Harmful if swallowed
R36/38: Irritating to eyes and skin
S – phrases:
S26: In case of contact with eyes, rinse immediately with
plenty of water and seek medical advice
S28: After contact with skin, wash immediately with plenty
of water
S37/39: Wear suitable gloves and eye/face protection
S36/37/39: Wear suitable protective clothing, gloves and
eye/face protection
S46: If swallowed, seek medical advice immediately and
show this container or label
S60: This material and its container must be disposed of as
hazardous waste
Hazard Statement:
H302: Harmful if swallowed.
H315: Causes skin irritation.
H319: Causes serious eye irritation
Precautionary Statement:
P280: Wear protective gloves/protective clothing/eye
protection/face protection.
P301+P312: IF SWALLOWED: Call a POISON CENTER
or doctor/physician if you feel unwell.
P302+P352: IF ON SKIN: Wash with plenty of soap and
water.
P305+P351+P338: IF IN EYES: Rinse cautiously with
water for several minutes. Remove contact lenses, if present
and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER or
doctor/physician.
P501: Dispose of contents/container to an approved waste
disposal plant.
Category Code:
Acute Tox. 4 - Acute toxicity category 4
Eye Irrit. 2 - Eye irritation category 2
Skin Irrit. 2 - Skin irritation category 2
OEL – occupational exposure limit
DNEL - derived no-effect level
PNEC - predicted no effect concentration
LD50 – lethal dose

according to Regulation (EC) No. 1907/2006 (REACH) and Commission Regulation (EU) No 453/2010



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	LC50 – lethal concentration
	EC50 - half maximal effective concentration
	NOAEL - no observed adverse effect level
	PBT or vPvB - persistent, bioaccumulative and toxic or
	very persistent very bioaccumulative
	TWA - Time-weighted average
Training instructions	Read carefully the SDS before using the product
Further information	The data contained in the safety data sheet is based on the amount of information and experience available to the company at this time. A consumer product is responsible for the consequences of its use in specific purposes. Information refers to this particular substance. It may be invalid in case this substance is used together with any other materials or any other production process. The user
,	bears responsibility for assessment of applicability and completeness of this information for his particular applications.
	REACH Registration dossier Chemical safety report for IRON SALTS CATEGORY.
	Chemical safety report for iron sulphate 2010-10-12 CSR-PI-5.2.6
	Specifications TU U 24.1-32785994-007:2008 Iron (II) sulfate technical.
Key literature references and	State standard DSTU 2463-94 (GOST 6981-94)
sources for data	Commercial copperas.
	Safety data card of hazardous factor dated 15.08.2008 No. 9612 B000010 Iron (II) sulfate.
	Safety data card of hazardous factor dated 09.03.2005 No. 3836 B000306 Iron (II) sulfate heptahydrate.
	Copperas Material Safety Data Sheet MSDS 32785994.21.00131.

ANNEX

EXPOSURE SCENARIOS ACCORDING TO CHEMICAL SAFETY REPORT

ES 1. MANUFACTURING OF IRON SULFATES	
ES 2. GENERIC FORMULATION INCLUDING PELLETISATION	***************************************
ES 3. WATER TREATMENT: TREATMENT OF RAW AND POTABLE WATERS	1
ES 4. WATER TREATMENT: TREATMENT OF WASTE WATERS AND WWTP SLUDGE	1
ES 5. BIOGAS TREATMENT AT WASTE TREATMENT PLANT	18
ES 6. USE AS REACTIVE PRODUCT/PRECURSOR	22
ES 7. MANUFACTURE OF CEMENT	26
ES 8. INDUSTRIAL USE OF CEMENT	30
ES 9. PROFESSIONAL AND CONSUMER USE OF CEMENT	3-
ES 10. PROFESSIONAL USE IN LAND REMEDIATION APPLICATIONS	390
ES 11. USE AS A LABORATORY CHEMICAL (INDUSTRIAL)	434
ES 12. USE AS A LABORATORY CHEMICAL (PROFESSIONAL)	46
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ES 15. ADHESIVES SEALANTS AND COATINGS (PROFESSIONAL AND CONSUMER)	59

ES 1. MANUFACTURING OF IRON S	ULFATES	
Section 1		
Exposure Scenario Title		
Title	Manufacturing of iron sulfates	
Use Descriptor	SU3, SU 8	
Process Categories and Environmental Release	PROC 1, 2, 3, 8b	
Categories	ERC 1	
Processes, tasks, activities covered	PROC 1: Use in closed process, no likelihood of exposure. (e. including enclosed sampling, waste collection & transfer, chargin discharging) PROC 2: Use in closed continuous processes with occasional exposure (e.g. during sampling, maintenance equipment cleaning, occasional interventions). PROC 3: Use in closed batch processes (synthesis or formulation (e.g. during sampling, maintenance, equipment breaks). PROC 8b: Transfer of substance or preparation (charging/discharging from/to vessels/large containers at dedicated facilities (e.g. drufilling, sampling, waste collection & transfer, charging, discharging) ERC 1: Manufacture of substances	
Section 2		
Operational conditions and risk management me		
Section 2.1 Control of worker exposure (PROC 1	, 2, 3, 8b)	
Product characteristics		
Physical form of product	Liquid (aqueous solution) or Soli granular/flake form rather than powder	
Concentration of substance in		
product		
Amounts used	Used amount of substance per day: 483 t Fe/d Annual amount used per site: 145 kT Fe/y	
Frequency and duration of use	Daily, up to 8 hours	
Operational conditions related to respiration and		
Respiration volume under conditions of use	10 m ³ /d	
Area of skin contact with the substance under conditions of use	240 480 (PROC2, 1500 (PROC7)	(PROC3) PROC8b)
Body weight	70 kg	
Risk management measures		
Containment and local exhaust ventilation	Containment plus good work practice	Yes
Containment and total exhaust ventuation	required	Tes
	Local exhaust ventilation required	No
	plus good work practise	110
Personal protective equipment (PPE)	Skin protection	Protective gloves
1 1 22222 12 2221	Eye protection	Safety glasses
	Clothing	Working clothing worn.
	Respiratory protection	Refer to control technologies
	and the same of th	below
	Breathing apparatus	Refer to control technologies below
Other risk management measures related to workers	Procedural and control technologies	It is assumed that solid salts are handled only in closed systems. If performing spraying, it is assumed that closed systems apply
	Training, Monitoring/reporting and auditing systems	Equipment must be well maintained and cleaned daily.
	Precautions against irritation	As necessary

Waste related measures	Any solid wastes are ultimately assumed to be disposed of via landfill or incineration.
Human factors not influenced by	Not available
risk management	
2.2 Control of environmental exposure (ERC 1)	
Product characteristics	
Physical form of product	Liquid (aqueous solution) or Solid salts (assumed to be in granular/flake form rather than powdered)
Concentration of substance in product	
Amounts used	Used amount of substance per day: 483 t Fe/d Annual amount used per site: 145 kT Fe/y
Frequency and duration of use	Emission days per site 300 d/y
Operational conditions of use	and a second and the
Fraction of applied amount lost from process/use to waste gas	0
Fraction of applied amount lost from process/use to waste water	0.0015
Risk management measures related to environment	ental emissions from industrial sites
Onsite pre-treatment of waste water	Not applicable.
Resulting fraction of initially applied amount in	
waste water released from site to the external	
sewage system	Not applicable.
Air emission abatement	Not applicable.
Resulting fraction of applied amount in waste gas released to environment	Not applicable.
Onsite waste treatment	Not applicable.
Fraction of initially applied amount sent to external waste treatment. This is the sum of direct losses from processes to waste, and the residues from onsite waste water and waste gas treatment.	Not applicable.
Municipal or other type of external waste water treatment	Yes
Effluent (of the waste water treatment plant) discharge rate	10000 m ³ /d
Recovery of sludge for agriculture or horticulture	Yes
2.3 Control of consumer exposure	
Consumer exposure is not relevant for the productio	n of iron sulfates.
Section 3: Exposure estimation	
Section 3.1 Health	

Dermal lo	cal exposure	(in ug/cm ²)		200 (PROC8b, in absence of LEV)						
		are via contact wi	tla		(4 (PROC8b)	n describe of LLV)				
substance	as such (in n	ng/kg bw/d)								
Dermal sy (in mg/kg	stemic expos bw/d)	ture via aqueous s	olution	0.014 (PROC8b)						
Inhalation				Negligible for contributing tasks that do not involve handling of solid products leading to evolution of dusts, or spraying of liquid product See also below						
Inhalation exposure (in mg/m³)/8h workday¹ (refers only to any contributing tasks involving handling of solid products leading to evolution of dusts)					i) Negligible, assuming any solids are processed only in a closed system. ii) 1.8 (PROC8a, 8b).(LEV but no PPE)					
nhalation in mg/m ³ refers onl spraying o	/8h workday y to any cont f liquid prod	ributing tasks invo uct)		Ne	gligible, assur	ming any spraying o	occurs only in	a closed system.		
2uantitat		acterisation for								
	Route	exposure concentrations (EC)	Leading toxic point Critical effect	end /	DN(M)EL (ECHA)	Risk characterisation ratio	DN(M)EL (ECETOC)	Risk characterisation ratio		
local	Dermal	mg/cm ² *	Skin and/or eye irritation		Not relevant	-	Not relevant			
effects	Inhalation	mg/m³	no data		Not relevant	2	Not relevant	7.1		
Acute - systemic	Dermal	mg/kg bw/d	Repeated dosé		Not quantified		Not quantified			
effects	Inhalation	mg/m ³ **	Repeated dose		Not quantified		Not quantified			
	Combined routes						1. Mil.	RCR Inhalation systemic + RC Dermal- systemic		
Long- term -	Dermal	mg/cm ² /d	Skin an eye irritat		Not relevant	2	Not relevant	-		
local effects	Inhalation	mg/m ³ ***	no data		Not relevant	-	Not relevant	-		
Long- term -	Dermal ^a		Repeated dose		1.3 - 2.0 mg/kg bw/d	0.11	6.5 - 10.0 mg/kg bw/d	0.02		
systemic effects	Inhalation		Repeated dose		4.6 - 7.2 mg/ m ³	0.39	23 - 36 mg/kg bw/d	0.08		
antin 2 1	Combined				100	0.50. Acceptable risk		0.10. Acceptable		
Section 3.1 Environment Emissions to air (dust)				0.08 (monohydrate) 0.004-0.08 (monohydrate and dried copperas) – bag filters ³ . 0.4 (monohydrate) – wet scrubbing <30-<50 mg/m ³						
	to water (Iroi nd (Solid wa				5 (with wet se					
	nd (Solid wa icterisation	ste)		8-2.	5 (monohydra	te)				
		ncluding sedimen								

6E-07 mg l			
45.0 mg kg dw	49.5 mg/kg dw	0.909	The PEC associated with production is less than the indicative PNEC, resulting in a PEC/PNEC ratio of 0.909. Conclusion: acceptable risk.
for the terrestria	l compartment		A
PEC	PNEC	PEC/PNEC	Discussion
53 mg/kg dw	55 mg/kg dw	0.965	The PEC associated with production results in a PEC/PNEC ratio of 0.965. Conclusion: acceptable risk.
	or the terrestria PEC 53 mg/kg dw	dw dw for the terrestrial compartment PEC PNEC 53 mg/kg dw 55 mg/kg dw	dw dw or the terrestrial compartment PEC PNEC PEC/PNEC

Section 4: Guidance to DU to check own conditions

Not available

Additional good practice advise beyond CSA

Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH

Not available

ES 2. GENERIC FORMULATION INC	CLUDING PELLETISATION				
Section 1					
Exposure Scenario Title	102				
Title	Generic formulation including pelletis	ation			
Use Descriptor	SU3, SU10				
Process Categories and Environmental Release Categories	PROC1, PROC2, PROC3, PROC4, PROC9, PROC14, PROC15 ERC2, ERC5				
Processes, tasks, activities covered	PROC1 Use in closed process, no like PROC2 Use in closed, continuous processoure PROC3 Use in closed batch process (see PROC4 Use in batch and other process for exposure arises PROC5 Mixing or blending in batch preparations and articles (multistage and/or significant contact) PROC8a Transfer of substance or prefrom/to vessels/large containers at non dedicated facilities PROC8b Transfer of substance or prefrom/to vessels/large containers at dedicated facilities PROC9 Transfer of substance or prefrom/to vessels/large containers at dedicated facilities PROC9 Transfer of substance or prefededicated filling line, including weighing) PROC14 Production of preparation compression, extrusion,	process with occasional controlled ynthesis or formulation) is (synthesis) where opportunity the processes for formulation of eparation (charging/discharging) eparation (charging/discharging)			
	palletisation PROC15 Use as laboratory reagent ERC2 Formulation of preparations ERC5 Industrial use resulting in inclusion into or onto a matrix				
0 1 2	Drees measural ase resaring in meras	TOIL HITO OF OHIO II HEREITA			
Section 2					
Operational conditions and risk management m	easures				
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PRO					
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PRO Product characteristics	C8a, PROC8b, PROC9, PROC14, PROC	15)			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC Product characteristics Physical form of product	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder	d salts (assumed to be in			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PRO Product characteristics	C8a, PROC8b, PROC9, PROC14, PROC	d salts (assumed to be in			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PRO Product characteristics Physical form of product Concentration of substance in product Amounts used	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder	d salts (assumed to be in ed)			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PRO Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder No data Used amount of substance per day 170 Annual amount used per site: 50 t/y Daily	d salts (assumed to be in ed)) kg salt; 420 kg solution			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PRO Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available dilut	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder No data Used amount of substance per day 170 Annual amount used per site: 50 t/y Daily ion capacity and characteristics of expe	d salts (assumed to be in ed)) kg salt; 420 kg solution			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available dilut Respiration volume under conditions of use	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder No data Used amount of substance per day 170 Annual amount used per site: 50 t/y Daily ion capacity and characteristics of experiments of the company o	d salts (assumed to be in ed)) kg salt; 420 kg solution osed humans			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available dilut Respiration volume under conditions of use Area of skin contact with the substance under	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder No data Used amount of substance per day 170 Annual amount used per site: 50 t/y Daily ion capacity and characteristics of experiments of the company o	d salts (assumed to be in ed)) kg salt; 420 kg solution psed humans PROC3, PROC15)			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available dilut Respiration volume under conditions of use Area of skin contact with the substance under conditions of use	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder No data Used amount of substance per day 170 Annual amount used per site: 50 t/y Daily ion capacity and characteristics of experimental experi	d salts (assumed to be in ed)) kg salt; 420 kg solution psed humans PROC3, PROC15)			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available dilut Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder No data Used amount of substance per day 170 Annual amount used per site: 50 t/y Daily ion capacity and characteristics of experimental expe	d salts (assumed to be in ed)) kg salt; 420 kg solution psed humans PROC3, PROC15)			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available dilut Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder No data Used amount of substance per day 170 Annual amount used per site: 50 t/y Daily ion capacity and characteristics of experimental parameters of the process of t	d salts (assumed to be in ed) O kg salt; 420 kg solution Osed humans PROC3, PROC15) PROC8b, PROC9, PROC14)			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available dilut Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder No data Used amount of substance per day 170 Annual amount used per site: 50 t/y Daily ion capacity and characteristics of experimental parameters of the process of t	d salts (assumed to be in ed) 0 kg salt; 420 kg solution 0 sed humans PROC3, PROC15) PROC8b, PROC9, PROC14)			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available dilut Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures Containment and local exhaust ventilation	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder No data Used amount of substance per day 170 Annual amount used per site: 50 t/y Daily ion capacity and characteristics of experimental process of the	d salts (assumed to be in ed) O kg salt; 420 kg solution Osed humans PROC3, PROC15) PROC8b, PROC9, PROC14)			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available dilut Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures Containment and local exhaust ventilation	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder No data Used amount of substance per day 170 Annual amount used per site: 50 t/y Daily ion capacity and characteristics of experimental process of the p	d salts (assumed to be in ed) Okg salt; 420 kg solution Okg salt; 420 kg solution PROC3, PROC15) PROC8b, PROC9, PROC14) Yes No Protective gloves Safety glasses			
Operational conditions and risk management m Section 2.1 Control of worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PRO Product characteristics Physical form of product Concentration of substance in product	C8a, PROC8b, PROC9, PROC14, PROC Liquid (aqueous solution) or Soli granular/flake form rather than powder No data Used amount of substance per day 170 Annual amount used per site: 50 t/y Daily ion capacity and characteristics of experimental experi	d salts (assumed to be in ed) O kg salt; 420 kg solution PROC3, PROC15) PROC8b, PROC9, PROC14) Yes No Protective gloves			

		below
	Breathing apparatus	Refer to control technologies below
Other risk management measures related to workers	Procedural and control technologies	It is assumed that solid salts are handled only in closed systems. If performing spraying, it is assumed that closed systems apply
	Training. Monitoring/reporting and auditing systems	Equipment must be well maintained and cleaned daily.
Waste related measures	Precautions against irritation Any solid wastes are ultimately assume or incineration.	As necessary ed to be disposed of via landfill
Human factors not influenced by risk management	Not available	
2.2 Control of environmental exposure (ERC2, E	RC5)	
Product characteristics	2032A	
Physical form of product	Liquid (aqueous solution) or Solid granular/flake form rather than powder	
Concentration of substance in product	No data	
Amounts used	Used amount of substance per day 170 Annual amount used per site: 50 t/y	kg salt; 420 kg solution
Frequency and duration of use	Emission days per site 300 d/y	
Operational conditions of use		
Fraction of applied amount lost from process/use to waste gas	0	
Fraction of applied amount lost from process/use to waste water	Variable depending on industry; difference Worst case approx. 2% (e.g. Formulation	
Risk management measures related to environment		
Onsite pre-treatment of waste water	Not applicable.	
Resulting fraction of initially applied amount in waste water released from site to the external		
sewage system	Not applicable.	
Air emission abatement Resulting fraction of applied amount in waste gas	Not applicable.	
released to environment	Not applicable.	
Onsite waste treatment	Not applicable.	
Fraction of initially applied amount sent to external waste treatment. This is the sum of direct losses from processes to waste, and the residues	The application	
from onsite waste water and waste gas treatment. Municipal or other type of external waste water	Not applicable. Yes	
Effluent (of the waste water treatment plant) discharge rate	$2000 \text{ m}^3/\text{d}$	
Recovery of sludge for agriculture or horticulture	Yes	
2.3 Control of consumer exposure		
Consumer exposure is not relevant for this scenario.		
Section 3: Exposure estimation		
Section 3.1 Health		

Dermal local exposure (in µg/cm²)	400 (PROC5, in absence of LEV)
Dermal systemic exposure via contact with substance as such (in mg/kg bw/d)	0.7 (PROC4)
Dermal systemic exposure via aqueous solution (in mg/kg bw/d)	0.07 (PROC4)
Inhalation exposure	Negligible for contributing tasks that do not involve handling of solid products leading to evolution of dusts, or spraying of liquid product
Inhalation exposure (in mg/m³)/8h workday (refers only to any contributing tasks involving handling of solid products leading to evolution of dusts)	i) Negligible, assuming any solids are processed only in a closed system.ii) 1.8 (PROC8a, 8b).(LEV but no PPE)
Inhalation exposure (in mg/m³)/8h workday³ (refers only to any contributing tasks involving spraying of liquid product)	n/a
(in mg/m³)/8h workday³ (refers only to any contributing tasks involving	TV2

	Route	exposure concentrations (EC)	Leading toxic end point / Critical effect	DN(M)EL (ECHA)	Risk characterisation ratio	DN(M)EL (ECETOC)	Risk characterisation ratio
local effects	Dermal	mg/cm ² *	Skin and/or eye irritation	Not relevant	Refer to qualitative risk characterisation below	Not relevant	Refer to qualitative rish characterisation below
	Inhalation	mg/m³	no data	Not relevant	=	Not relevant	-
Acute - systemic	Dermal	mg/kg bw/d	Repeated dose	Not quantified		Not quantified	
effects	Inhalation	mg/m³ **	Repeated dose	Not quantified		Not quantified	
	Combined routes				RCR Inhalation- systemic + RCR Dermal- systemic		RCR Inhalation systemic + RCI Dermal- systemic
Long- term – local effects	Dermal	mg/cm ² /d	Skin and/or eye irritation	Not relevant	Refer to qualitative risk characterisation below	Not relevant	Refer t qualitative ris characterisation below
	Inhalation	mg/m ³ ***	no data	Not relevant	-	Not relevant	~
Long- term - systemic	Dermal ^a		Repeated dose	1.3 - 2.0 mg/kg bw/d	0.54	6.5 - 10.0 mg/kg bw/d	0.11
effects	Inhalation		Repeated dose	4.6 - 7.2 mg/ m ³	0.39	23 - 36 mg/kg bw/d	0.08
.: 21	Combined routes				0.93. Acceptable risk		0.19. Acceptable risk

Section 3.1 Environment

Air Release (direct + STP) 0

Aquatic Release (before WWTP) 3.3 kg/d

Soil Release (direct releases only) 0

Risk characterisation

Compartments	PEC	PNEC	PEC/PNEC	Discussion
Surface water	2.4E-06 mg/l		Sel	-
Freshwater sediment	45.0 mg/kg dw	49.5 mg/kg dw	0.909	The PEC associated with production is less than the indicative PNEC, resulting in a PEC/PNEC ratio of 0.909. Conclusion: acceptable risk.

Compartments	PEC	PNEC	PEC/PNEC	Discussion
Industrial soil	50.1 mg/kg dw	55 mg/kg dw	0.91	The PEC associated with production results in a PEC/PNEC ratio of 0.91. Conclusion: acceptable risk.

Atmospheric compartment
No basis for risk characterisation. Not applicable
Section 4: Guidance to DU to check own conditions

Additional good practice advise beyond CSA

Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in

Article 37 (4) of REACH

Not available

ES 3. WATER TREATMENT: TREAT	MENT OF DAW AND DOTABLE	LEWATEDS			
Section 1	MENT OF KAW AND FUTABLE	LE WATERS			
Exposure Scenario Title					
Title	Water to observe the star of Control 1				
Use Descriptor	Water treatment: treatment of raw and	potable waters			
Process Categories and Environmental Release	SU3, SU 0				
Categories	PROC 2, 5, 8a, 8b ERC 4				
Processes, tasks, activities covered	PROC2 Use in closed, continuous process with occasional controlled				
	exposure				
	PROC5 Mixing or blending in batel	n processes for formulation of			
	preparations and articles				
	(multistage and/or significant contact)				
	PROC 8a Transfer of substance or pre- from/to vessels/large	paration (charging/discharging)			
	containers at non dedicated facilities				
	PROC8b Transfer of substance or pre	paration (charging/discharging)			
	from/to vessels/large	parament (charging disental ging)			
	containers at dedicated facilities				
	ERC4 Industrial use of processing aid	s in processes and products, not			
	becoming part of articles	150			
Section 2					
Operational conditions and risk management m	easures				
Section 2.1 Control of worker exposure					
(PROC 2, 5, 8a, 8b)					
Product characteristics					
Physical form of product	Liquid (aqueous solution) or Soli				
	granular/flake form rather than powdered)				
Concentration of substance in	No data				
product Amounts used					
Amounts used	Approx. 1800 kg iron salt per day. (app				
Frequency and duration of use	Annual amount used per site: 210 T Fe/y Daily, up to 8 hours				
Operational conditions related to available dilut					
Respiration volume under conditions of use	10 m ³ /d	osed numans			
Area of skin contact with the substance under		PROC5, PROC8b)			
conditions of use	960 (PROC8a)	TROCS, TROCSU			
Body weight	70 kg				
Risk management measures	10 45				
and the same of th					
Containment and local exhaust ventilation	Containment plus good work practice	Yes			
	required				
	Local exhaust ventilation required	No .			
	plus good work practise				
Personal protective equipment (PPE)	Skin protection	Protective gloves			
	Eye protection	Safety glasses			
	Clothing	Working clothing worn.			
	Respiratory protection	If handling solid salts, Filter			
		mask P2 (FFP2) must be			
	Respiratory protection	mask P2 (FFP2) must be used, in the absence of LEV			
Other rick management	Respiratory protection Breathing apparatus	mask P2 (FFP2) must be used, in the absence of LEV None			
Other risk management measures related to	Respiratory protection	mask P2 (FFP2) must be used, in the absence of LEV None If handling solid salts, LEV			
Other risk management measures related to workers	Respiratory protection Breathing apparatus	mask P2 (FFP2) must be used, in the absence of LEV None If handling solid salts, LEV OR containment and			
	Respiratory protection Breathing apparatus Procedural and control technologies	mask P2 (FFP2) must be used, in the absence of LEV None If handling solid salts, LEV OR containment and ventilation must be available.			
	Respiratory protection Breathing apparatus Procedural and control technologies Training. Monitoring/reporting and	mask P2 (FFP2) must be used, in the absence of LEV None If handling solid salts, LEV OR containment and ventilation must be available. Equipment must be well			
	Respiratory protection Breathing apparatus Procedural and control technologies Training. Monitoring/reporting and auditing systems	mask P2 (FFP2) must be used, in the absence of LEV None If handling solid salts, LEV OR containment and ventilation must be available. Equipment must be well maintained and cleaned daily.			
workers	Respiratory protection Breathing apparatus Procedural and control technologies Training. Monitoring/reporting and auditing systems Precautions against irritation	mask P2 (FFP2) must be used, in the absence of LEV None If handling solid salts, LEV OR containment and ventilation must be available. Equipment must be well maintained and cleaned daily. As necessary			
	Respiratory protection Breathing apparatus Procedural and control technologies Training. Monitoring/reporting and auditing systems Precautions against irritation Any solid wastes are ultimately assume	mask P2 (FFP2) must be used, in the absence of LEV None If handling solid salts, LEV OR containment and ventilation must be available. Equipment must be well maintained and cleaned daily. As necessary			
workers	Respiratory protection Breathing apparatus Procedural and control technologies Training. Monitoring/reporting and auditing systems Precautions against irritation	mask P2 (FFP2) must be used, in the absence of LEV None If handling solid salts, LEV OR containment and ventilation must be available. Equipment must be well maintained and cleaned daily. As necessary			

Product characteristic Physical form of produc Concentration of substant product Amounts used	t		Liquid James		20 17 1			
Concentration of substan product Amounts used			I territed (acres					
product Amounts used			Liquid (aqueous solution) or Solid salts (assumed to be granular/flake form rather than powdered)					
	nce in		No data					
			Approx. 1800 kg iron salt per day. (approx. 700 kg Fe'day) Annual amount used per site: 210 T Fe/y					
Fraguency and duration	ofines							
Frequency and duration Operational conditions			Emission days per site 300 d/y					
Fraction of applied amo		annalum.	0					
to waste gas			1					
Fraction of applied amo to waste water	*		1%					
Risk management mea	sures related to e	environm	ental emissions	from industrial sit	es			
Onsite pre-treatment of			Not applicable	v e				
Resulting fraction of in waste water released f	itially applied am rom site to the	ount in external						
sewage system			Not applicable					
Air emission abatement			Not applicable					
Resulting fraction of app	olied amount in w	aste gas	11					
released to environment			Not applicable					
Onsite waste treatment			Not applicable					
Fraction of initially a	applied amount	sent to	or approudic					
external waste treatment								
losses from processes to								
from onsite waste water and waste gas treatment.			Not applicable					
Municipal or other type of external waste water			Yes	4	•			
treatment	The Control of the Co		1 03					
Effluent (of the waste discharge rate	water treatmen	t plant)	2000 m ³ /d					
Recovery of sludge for a		culture	Yes					
2.3 Control of consume								
Consumer exposure is no		scenario.						
Section 3: Exposure est	imation							
Section 3.1 Health								
Dermal local exposure			400 (PROC5,	n absence of LEV)				
(in μg/cm ²)								
Dermal systemic exposur	re via contact with	1	0.3 (PROC8a)					
substance as such								
(in mg/kg bw/d)								
Dermal systemic exposur	re via aqueous sol	ution	0.03 (PROC8a)					
(in mg/kg bw/d)		-M53,5/50						
Inhalation exposure			Negligible for contributing tasks that do not involve handling of solid products leading to evolution of dusts, or spraying of liquid product See also below					
Inhalation exposure			i) 1.8 (PROC8a, 8b).(LEV but no PPE)					
(in mg/m³)/8h workday				OC8a, 8b). Cont		mechanical/natura		
(refers only to any contri	buting tasks invol	ving		d PPE (Filter mask				
handling of solid product	s leading to evolu	tion of	exposure and i	nanage risks. Equip	ment must be	well maintained an		
dusts)	1651		cleaned daily.					
Inhalation exposure			n/a					
(in mg/m³)/8h workday								
(refers only to any contri	buting tasks invol	ving						
spraying of liquid produc	t)							
Quantitative risk chara	cterisation for w	orkers						
Route	exposure	Leading	g DN(M)EL	Risk	DN(M)EL	Risk		
	concentrations (EC)	toxic end point	(ECHA)	characterisation ratio	(ECETOC)	characterisation ratio		

			Critic effect	aI			
Acute - local effects	Dermal	mg/cm²*	Skin and/or eye irritatio	101014111	-	Not relevant	-
	Inhalation	mg/m³	no data	Not relevant		Not relevant	-
Acute - systemic	Dermal	mg/kg bw/d	Repeat			Not quantified	
effects	Inhalation	mg/m ³ **	Repeat			Not quantified	
	Combined routes				RCR Inhalation- systemic + RCR Dermal- systemic	quantifica	RCR Inhalation systemic + RCI Dermal- systemic
Long- term – local effects	Dermal	mg/cm ² /d	Skin and/or eye irritatio	Not relevant	-	Not relevant	-
	Inhalation	mg/m ³ ***	no data	Not relevant		Not relevant	(2)
Long- term - systemic effects	Dermal ^a		Repeat dose		0.23	6.5 - 10.0 mg/kg bw/d	0.05
	Inhalation		Repeat dose		0.43	23 - 36 mg/kg bw/d	0.09
	Combined routes				0.66. Acceptable		0.14. Acceptabl
	Environmen	nt					
				0 0.4 kg/day (po 4 kg/day (indu	table water) strial locations)		
oil Release				0			
	cterisation	1 12 1					
Compart		PEC PEC	PNEC	PEC/PNEC	Discussion		
	al use (coagu		THEC	I LC/FNEC	Discussion		
Surface w	4.7	2.6E-06 mg/l			-		
Freshwater sediment 45.0 mg/kg 49.5		49.5 mg/kg dw	0.909	the indicative PN	The PEC associated with production is less than the indicative PNEC, resulting in a PEC/PNEC ratio of 0.909. Conclusion: acceptable risk.		
					The second secon		1
Industria	al use (sludge	e conditioning)					
Industria Surface w		2.6E-06 mg/l		-	-		

Compartments	PEC	PNEC	PEC/PNEC	Discussion
Industrial use (co	pagulant)			
Agricultural soil	50.0 mg/kg dw	55.0 mg/kg dw	0.911	The PEC associated with production results in a PEC/PNEC ratio of 0.911. Conclusion: acceptable risk.
Industrial use (sl	udge condition	ing)		*
Agricultural soil	50.1 mg/kg dw	55.0 mg/kg dw	0.911	The PEC associated with production results in a PEC/PNEC ratio of 0.911. Conclusion: acceptable risk.
Atmospheric compa	rtment			
No basis for risk cha	racterisation. N	ot applicable		
Section 4: Guidance	e to DU to che	ck own conditi	ons	
Not available				
Additional good provide: The measures estimates related to the Article 37 (4) of REA	reported in this he exposure sce	section have no	t been taken into ey are not subje	account in the exposure ct to obligation laid down in
lot available				

ES 4. WATER TREATMENT: TREAT	MENT OF WASTE WATER	S AND WWTP SLUDGE
Section 1		
Exposure Scenario Title		
Title	Water treatment: treatment of wast	e waters and WWTP sludge
Use Descriptor	SU3, SU 0	
Process Categories and Environmental Release	PROC 2, 5, 8a, 8b	
Categories	ERC 4,5	
Processes, tasks, activities covered		process with occasional controlled
	exposure	
	PROC5 Mixing or blending in 1	patch processes for formulation of
	preparations and articles	
	(multistage and/or significant conta	
	from/to vessels/large	preparation (charging/discharging)
	containers at non dedicated facilities	as a
		preparation (charging/discharging)
	from/to vessels/large	preparation (enarging disenarging)
	containers at dedicated facilities	
	ERC4 Industrial use of processing	aids in processes and products, not
	becoming part of articles	
	ERC5 Industrial use resulting in in	clusion into or onto a matrix
Section 2		
Operational conditions and risk management me	easures	
Section 2.1 Control of worker exposure		
(PROC 2, 5, 8a, 8b)		
Product characteristics		
Physical form of product		Solid salts (assumed to be in
Concentration of substance in	granular/flake form rather than pov No data	vdered)
product	No data	
Amounts used	Water treatment: 200 kg Fald	lay assuming 2000 m ³ effluent
THIOTHS AGEG	Sludge treatment: approx 34 kg	Fe/day based on approx. 28 m ³
	sludge/d	reday based on approx 20 m
	Annual amount used per site: 85 T	Fe/v
Frequency and duration of use	Daily, up to 8 hours	
Operational conditions related to available diluti	on capacity and characteristics of	exposed humans
Respiration volume under conditions of use	10 m ³ /d	•
Area of skin contact with the substance under	480 (PROC2,	PROC5, PROC8b)
conditions of use	960 (PROC8a)	
Body weight	70 kg	
Risk management measures		
Contribution		
Containment and local exhaust ventilation	Containment plus good work pract	ice Yes
	required	rad No.
	Local exhaust ventilation require plus good work practise	red No
Personal protective equipment (PPE)	Skin protection	Protective gloves
reisonar protective equipment (11E)	Eye protection	Safety glasses
	Clothing	Working clothing worn.
	Respiratory protection	If handling solid salts, Filter
	Topical Protoction	mask P2 (FFP2) must be
		used, in the absence of LEV
	Breathing apparatus	None
Other risk management measures related to	Procedural and control technologies	
workers		OR containment and
		ventilation must be available.
	Training. Monitoring/reporting a	nd Equipment must be well
	Training. Monitoring/reporting a auditing systems Precautions against irritation	

Waste related measures	Any solid wastes are ultimately assumed to be disposed of via landfill or incineration.		
Human factors not influenced by risk management	Not available		
2.2 Control of environmental exposure (ERC 4)			
Product characteristics			
Physical form of product	Liquid (aqueous solution) or Solid salts (assumed to be in granular/flake form rather than powdered)		
Concentration of substance in product	No data		
Amounts used	Water treatment: 200 kg Fe/day assuming 2000 m ³ effluent Sludge treatment: approx. 34 kg Fe/day based on approx. 28 m ³ sludge/d Annual amount used per site: 85 T Fe/y		
Frequency and duration of use	Emission days per site 365 d/y		
Operational conditions of use			
Fraction of applied amount lost from process/use to waste gas	0		
Fraction of applied amount lost from process/use to waste water	1%		
Other given operational conditions affecting environmental exposure	It is necessary to consider what loading levels are typically used for different purposes at different types of WWTPs, and the stage of the treatment that the iron salts are loaded, in order to consider the quantity which may pass to treated effluent and hence to the environment, and also, importantly, to consider the fate of the iron after use. Municipal WWTP: - Relief flocculation (usually a preprecipitation process) This is a temporary arrangement rather than a routine one, used in case of WWTP overload; during renovation; or in case of additional purification needed due to highly polluted influent (i.e. for a specific influent stream). - Sulfide control (outdoor control) (usually a pretreatment before primary sedimentation) - Phosphate removal. The iron passes to organic digester sludge, which will be spread to land, only under certain circumstances - Any solid wastes are ultimately assumed to be disposed of via landfill or incineration. Details of the treatment of aqueous waste would vary at different sites but as a minimum the effluent treated in either in on-site or municipal secondary biological treatment plants prior to discharge. As an overall worst case: a loading of 100 g/m ³ for the total flow of a typical municipal WWTP would be equivalent to approx. 200 kg Fe/d and this is assumed in the model for the coagulant use.		
Risk management measures related to environme			
Onsite pre-treatment of waste water Resulting fraction of initially applied amount in waste water released from site to the external	Not applicable.		
sewage system	Not applicable.		
Air emission abatement Resulting fraction of applied amount in waste gas	Not applicable.		
released to environment	Not applicable.		
Onsite waste treatment	Not applicable.		
Fraction of initially applied amount sent to external waste treatment. This is the sum of direct losses from processes to waste, and the residues from onsite waste water and waste gas treatment.	Not applicable.		
Municipal or other type of external waste water	Yes		
maneipar or other type or external waste water	1 69		

treatment	
Effluent (of the waste water treatment plant)	2000 m³/d
discharge rate	
Recovery of sludge for agriculture or horticulture	Yes
2.3 Control of consumer exposure	
Consumer exposure is not relevant for this scenario	
Section 3: Exposure estimation	
Section 3.1 Health	
Dermal local exposure (in μg/cm²)	400 (PROC5, in absence of LEV)
Dermal systemic exposure via contact with substance as such (in mg/kg bw/d)	0.3 (PROC8a)
Dermal systemic exposure via aqueous solution (in mg/kg bw/d)	0.03 (PROC8a)
Inhalation exposure	Negligible for contributing tasks that do not involve handling of solid products leading to evolution of dusts, or spraying of liquid product See also below
Inhalation exposure (in mg/m³)/8h workday (refers only to any contributing tasks involving handling of solid products leading to evolution of dusts)	i) 1.8 (PROC8a, 8b).(LEV but no PPE) ii) 2.01 (PROC8a, 8b). Containment and mechanical/natura ventilation; and PPE (Filter mask P2 (FFP2)) must be used to limi exposure and manage risks. Equipment must be well maintained and cleaned daily.
Inhalation exposure (in mg/m³)/8h workday (refers only to any contributing tasks involving spraying of liquid product) Quantitative risk characterisation for workers	n/a

	Route	exposure concentrations (EC)	Leading toxic end point / Critical effect	DN(M)EL (ECHA)	Risk characterisation ratio	DN(M)EL (ECETOC)	Risk characterisation ratio
Acute - local effects	Dermal	mg/cm ² *	Skin and/or eye irritation	Not relevant	-	Not relevant	
	Inhalation	mg/m ³	no data	Not relevant	(*)	Not relevant	-
Acute - systemic	Dermal	mg/kg bw/d	Repeated dose	Not quantified		Not quantified	
effects	Inhalation	mg/m ³ **	Repeated dose	Not quantified		Not quantified	
	Combined routes			A	RCR Inhalation- systemic + RCR Dermal- systemic		RCR Inhalation- systemic + RCR Dermal- systemic
Long- term – local effects	Dermal	mg/cm ² /d	Skin and/or eye irritation	Not relevant	e.	Not relevant	
	Inhalation	mg/m ³ ***	no data	Not relevant		Not relevant	*
Long- term - systemic	Dermal ^a		Repeated dose	1.3 - 2.0 mg/kg bw/d	0.23	6.5 - 10.0 mg/kg bw/d	0.05
effects	Inhalation		Repeated dose	4.6 - 7.2 mg/ m ³	0.43	23 - 36 mg/kg bw/d	0.09
	Combined	Wheeldsell			0.66. Acceptable	5 1/3 / 1977	0.14. Acceptable

routes					risk	risk
Section 3.1 Enviror	ment					
Air Release				0.		
Aquatic Release WWTP flow (defaul Dilution in surface v				200 kg Fe/day entering WWTP (potable water) 34 kg Fe/day entering WWTP (industrial locations)		
Soil Release				0		
Risk characterisati	on					
Aquatic compartmen	it (including	sedime	ent)			
Compartments	PEC		PNEC	PEC/PNEC Discussion		
Industrial use (co	agulant)					
Surface water	2.4E-0 mg/l)6		30	-	
Freshwater sedime	Freshwater sediment 45.0 mg/kg dw		49.5 mg/kg dw	0.909	the indicative P	iated with production is less than PNEC, resulting in a PEC/PNEC Conclusion: acceptable risk.
Industrial use (sl	udge conditi	oning)				1
Surface water 2.6E-06 mg/l			5	Hai		
Freshwater sediment 45.0 mg/kg dw		49.5 mg/kg dw	0.909	the indicative P	iated with production is less than PNEC, resulting in a PEC/PNEC Conclusion: acceptable risk.	
Risk characterisation	for the terre	strial c	ompartment			
Compartments PEC PNEC		NEC	PEC/PNEC	Discussion		
Industrial use (co	agulant)					
The state of the s			0.924		ted with production results in a of 0.924. Conclusion:	
Industrial use (sl						
Agricultural soil 50.7 mg/kg dw 55.0		5.0 mg/kg w	0.924		ted with production results in a of 0.924. Conclusion:	
Atmospheric compar						
No basis for risk cha						
section 4: Guidance	to DU to c	heck o	wn conditio	ens		
Not available						
Additional good pra Note: The measures a stimates related to the Article 37 (4) of REA	reported in the exposure s	is sect	ion have not	been taken into ey are not subjec	account in the exp	oosure I down in
Not available						

ES 5. BIOGAS TREATMENT AT WAS	STE TREATMENT PLANT				
Section 1					
Exposure Scenario Title Title	Di i				
Use Descriptor	Biogas treatment at waste treatment pl SU3, SU 10	ant			
Process Categories and Environmental Release	PROC 2, 8a, 8b				
Categories	ERC 4, 2, 6b				
Processes, tasks, activities covered	PROC2 Use in closed, continuous pro- exposure PROC 8a Transfer of substance or pre- from/to vessels/large containers at non dedicated facilities PROC8b Transfer of substance or pre-	eparation (charging/discharging)			
	from/to vessels/large containers at dedicated facilities ERC4: Industrial use of processing aids in processes and products, no becoming part of articles ERC2: Formulation of preparations ERC6b: Industrial use of reactive processing aids				
Section 2					
Operational conditions and risk management m Section 2.1 Control of worker exposure	easures				
(PROC 2, 8a, 8b)					
Product characteristics					
Physical form of product	Liquid (aqueous solution) or Soli	d calte (accumed to be in			
	granular/flake form rather than powder				
Concentration of substance in .	No data				
product					
Amountsused	Used amount of substance per day :2.6 kg Fe/day assuming 2000 m ³ effluent Annual amount used per site: 0.95 T Fe/y				
Frequency and duration of use	Daily, up to 8 hours				
Operational conditions related to available dilut		osed humans			
Respiration volume under conditions of use	10 m ³ /d				
Area of skin contact with the substance under	480 (PROC2,	PROC8b)			
conditions of use	960 (PROC8a)				
Body weight	70 kg				
Risk management measures					
Containment and local exhaust ventilation	Containment plus good work practice	Yes			
	required				
9	Local exhaust ventilation required	No			
Personal protective equipment (PPE)	plus good work practise	D-t-ti			
rersonar protective equipment (FFE)	Skin protection Eye protection	Protective gloves Safety glasses			
	Clothing	Working clothing worn.			
	Respiratory protection	If handling solid salts, Filter mask P2 (FFP2) must be used, in the absence of LEV			
	Breathing apparatus	None			
Other risk management measures related to workers	Procedural and control technologies	If handling solid salts, LEV OR containment and ventilation must be available.			
	Training, Monitoring/reporting and auditing systems	Equipment must be well maintained and cleaned daily.			
Waste related measures	Precautions against irritation Any solid wastes are ultimately assume or incineration.	As necessary ed to be disposed of via landfill			
Human factors not influenced by risk management	Not available				

2.2 Control of environmental exposure (ERC 4,	2. 6b)
Product characteristics	
Physical form of product	Liquid (aqueous solution) or Solid salts (assumed to be in granular/flake form rather than powdered)
Concentration of substance in product	No data
Amounts used	Used amount of substance per day :2.6 kg Fe/day assuming 2000 m ³ effluent Annual amount used per site: 0.95 T Fe/y
Frequency and duration of use	Emission days per site 365 d/y
Operational conditions of use	
Fraction of applied amount lost from process/use to waste gas	0
Fraction of applied amount lost from process/use to waste water	1%
Other given operational conditions affecting environmental exposure Risk management measures related to environm	The digestion process is enclosed; air emissions are unlikely, except during transfer to and from the digester. Particulate emissions are also less likely than from aerobic digestion because the process is enclosed, but there will probably be some waste preparation units which may have larger particulate emissions (BREF waste treatment date not given in ES). This is an exceptionally large local WWTP by the standards of the EU default. For a standard typical WWTP of 2,000 m³/day, the equivalent loading rate would be 6.6 kg iron salt/day, i.e. approx. 2.6 kg Fe/day. Disposal of the resulting digester sludge is presumed to be analogous to that from wastewater and sludge treatment at WWTPs. It is assumed that a proportion of the largely inorganic coagulated mass is removed from the process and destroyed. In any case further treatment or chemical disposal of the resulting sludge may be presumed.
	cital chissions from mustral sites
Onsite pre-treatment of waste water	Not applicable.
Resulting fraction of initially applied amount in waste water released from site to the external sewage system	Not applicable.
Air emission abatement	Not applicable.
Resulting fraction of applied amount in waste gas	
released to environment	Not applicable.
Onsite waste treatment	Not applicable.
Fraction of initially applied amount sent to external waste treatment. This is the sum of direct losses from processes to waste, and the residues from onsite waste water and waste gas treatment.	Not applicable.
Municipal or other type of external waste water treatment	Yes
Effluent (of the waste water treatment plant) discharge rate	2000 m ³ /d
Recovery of sludge for agriculture or horticulture	Yes
2.3 Control of consumer exposure	
Consumer exposure is not relevant for this scenario.	
Section 3: Exposure estimation	
Section 3.1 Health	

	Route	exposure	Leading	DN(M)EL	Risk	DN(M)EL Risk		
Quantitat	ive risk char	racterisation for	workers					
(refers only spraying o	/8h workday y to any cont f liquid prod	ributing tasks inv uct)		n/a				
Inhalation exposure (in mg/m³)/8h workday (refers only to any contributing tasks involving handling of solid products leading to evolution of dusts)				ventilation; an	OC8a, 8b d PPE (Filt	but no PPE) Containment and mechan r mask P2 (FFP2)) must be u s. Equipment must be well mai	sed to limi	
Inhalation	exposure			Negligible for contributing tasks that do not involve handling of solid products leading to evolution of dusts, or spraying of liquid product See also below				
Dermal sy (in mg/kg		sure via aqueous s	solution	0.03 (PROC8a)			
Dermal sy substance (in mg/kg	as such	sure via contact w	ith	0.3 (PROC8a)				
(in µg/cm ²				200 (PROC8b, in absence of LEV)				

	Route	exposure concentrations (EC)	Leading toxic end	DN(M)EL (ECHA)	Risk characterisation ratio	DN(M)EL (ECETOC)	Risk characterisation ratio
			point / Critical effect				
Acute - local effects	Dermal	mg/cm ² *	Skin and/or eye irritation	Not relevant	-	Not relevant	-
	Inhalation	mg/m³	no data	Not relevant	-	Not relevant	-
Acute - systemic	Dermal	mg/kg bw/d	Repeated dose	Not quantified		Not quantified	
effects	Inhalation	mg/m³ **	Repeated dose	Not quantified		Not quantified	
	Combined routes				RCR Inhalation- systemic + RCR Dermal- systemic		RCR Inhalation- systemic + RCR Dermal- systemic
Long- term – local effects	Dermal	mg/cm ² /d	Skin and/or eye irritation	Not relevant	-	Not relevant	
	Inhalation	mg/m³ ***	no data	Not relevant	-	Not relevant	2
Long- term - systemic	Dermal ^a		Repeated dose	1.3 - 2.0 mg/kg bw/d	0.23	6.5 - 10.0 mg/kg bw/d	0.05
effects	Inhalation		Repeated dose	4.6 - 7.2 mg/ m ³	0.43	23 - 36 mg/kg bw/d	0.09
	Combined routes		Barton III		0.66. Acceptable risk		0.14. Acceptable risk

Section	3.1	Environment
A Court Than I a		

Air Release	0 kg Fe/day
Aquatic Release WWTP flow (default) – 2E+06 L/day Dilution in surface water (default) – 10	2.6 kg Fe/day
Soil Release	0
Risk characterisation	

Compartments	PEC	PNEC	PEC/PNEC	Discussion
Surface water	2.4E-06 mg/l		-	-
Freshwater sediment	45.0 mg/kg dw	49.5 mg/kg dw	0.909	The PEC associated with production is less than the indicative PNEC, resulting in a PEC/PNEC ratio of 0.909. Conclusion: acceptable risk.

Compartments	PEC	PNEC	PEC/PNEC	Discussion
Agricultural soil	50.1 mg/kg dw	55 mg/kg dw	0.91	The PEC associated with production results in a PEC/PNEC ratio of 0.91. Conclusion: acceptable risk.

Atmospheric compartment
No basis for risk characterisation. Not applicable

Section 4: Guidance to DU to check own conditions

Not available

Additional good practice advise beyond CSA

Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH Not available

	PRECURSOR	
Section 1		
Exposure Scenario Title	11.	
Title	Use as reactive product/precursor	
Use Descriptor	SU3, 8, 9, 10, 14	
Process Categories and Environmental Release	PROC 2, 3, 4, 8b, 9, 22 15, 26	
Categories Processes, tasks, activities covered	ERC 1, 4, 5, 6a, 6b PROC2 Use in closed, continuous pro	
	exposure PROC3 Use in closed batch process (sy PROC4 Use in batch and other process for exposure arises PROC8b Transfer of substance or pre from/to vessels/large containers at dedicated facilities PROC9 Transfer of substance or pre (dedicated filling line, including weighing) PROC15 Use as laboratory reagent PROC22 Potentially closed pri minerals/metals at elevated temperature Industrial setting PROC26 Handling of solid inorg temperature ERC1 Manufacture of substances ERC4 Industrial use of processing aids becoming part of articles ERC5 Industrial use resulting in inclusive ERC6a Industrial use resulting in manufacture of intermediates)	s (synthesis) where opportunity paration (charging/discharging sparation into small containers rocessing operations with a sin processes and products, not ion into or onto a matrix nufacture of another substance
	ERC6b Industrial use of reactive proces	ssing aids
Section 2		
Operational conditions and side		
Operational conditions and risk management me	easures	
Section 2.1 Control of worker exposure	easures	
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b)	easures	
Section 2.1 Control of worker exposure	easures	
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics	Liquid (aqueous solution) or Solid	
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in		
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product	Liquid (aqueous solution) or Soli- granular/flake form rather than powder No data	ed)
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product	Liquid (aqueous solution) or Soli- granular/flake form rather than powder. No data Used amount of substance per day: Ap	ed)
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product Amounts used	Liquid (aqueous solution) or Solingranular/flake form rather than powder. No data Used amount of substance per day: Ap Annual amount used per site: 6000 t/y	ed)
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use	Liquid (aqueous solution) or Solingranular/flake form rather than powder No data Used amount of substance per day: Ap Annual amount used per site: 6000 t/y Daily, up to 8 hours	prox. 20 t/d
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available dilutions	Liquid (aqueous solution) or Solingranular/flake form rather than powdered No data Used amount of substance per day: Ap Annual amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of expe	prox. 20 t/d
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available diluti Respiration volume under conditions of use	Liquid (aqueous solution) or Soligranular/flake form rather than powder. No data Used amount of substance per day: Ap Annual amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of expe	prox. 20 t/d psed humans
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available dilutions	Liquid (aqueous solution) or Soligranular/flake form rather than powder. No data Used amount of substance per day: Ap Annual amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental experimental experiments of the control of the	prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available diluti Respiration volume under conditions of use Area of skin contact with the substance under conditions of use	Liquid (aqueous solution) or Solingranular/flake form rather than powder No data Used amount of substance per day: Ap Annual amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental experiments of the compact of th	prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available diluting Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight	Liquid (aqueous solution) or Soligranular/flake form rather than powder. No data Used amount of substance per day: Ap Annual amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental experimental experiments of the control of the	prox. 20 t/d prox. 20 t/d prox. 20 t/d proced humans PROC15 PROC9 (PROC22)
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available diluting Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures	Liquid (aqueous solution) or Solingranular/flake form rather than powder No data Used amount of substance per day: Ap Annual amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental experiments of the compact of th	prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available diluting Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight	Liquid (aqueous solution) or Solingranular/flake form rather than powder No data Used amount of substance per day: Ap Annual amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental a	prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d PROC15) PROC15) PROC22) (PROC22) out assumed to be approx. 1980 Yes
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available diluti Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures	Liquid (aqueous solution) or Solingranular/flake form rather than powder No data Used amount of substance per day: Ap Annual amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental states of the	prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available diluting Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures Containment and local exhaust ventilation	Liquid (aqueous solution) or Solingranular/flake form rather than powdered No data Used amount of substance per day: Ap Annual amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental amount used per site: 6000 t/y PROC3, 480 (PROC2, PROC4, 1980) PROC26 – not specified by ECETOC by 70 kg Containment plus good work practice required Local exhaust ventilation required plus good work practise	prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d
Section 2.1 Control of worker exposure (PROC 2, 8a, 8b) Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to available diluting Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures	Liquid (aqueous solution) or Solingranular/flake form rather than powder No data Used amount of substance per day: Ap Annual amount used per site: 6000 t/y Daily, up to 8 hours ion capacity and characteristics of experimental states of the	prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d prox. 20 t/d PROC15) PROC8b, PROC9) (PROC22) put assumed to be approx. 1980 Yes

	Respiratory protection	Refer to control technologies below		
	Breathing apparatus	Refer to control technologies below		
Other risk management measures related to workers	Procedural and control technologies	It is assumed that solid salts are handled only in closed systems or with LEV		
	Training. Monitoring/reporting and auditing systems Precautions against irritation	Equipment must be well maintained and cleaned daily. As necessary		
Waste related measures	Any solid wastes are ultimately assume or incineration.	The state of the s		
Human factors not influenced by risk management	Not available			
2.2 Control of environmental exposure (ERC 1, 4	, 5, 6a, 6b)			
Product characteristics				
Physical form of product	Liquid (aqueous solution) or Soli granular/flake form rather than powder			
Concentration of substance in product	No data			
Amounts used	Used amount of substance per day: Approx. 20 t/d Annual amount used per site: 6000 t/y			
Frequency and duration of use	Emission days per site 300 d/y			
Operational conditions of use				
Fraction of applied amount lost from process/use to waste gas	0			
Fraction of applied amount lost from process/use to waste water .	0.005			
Risk management measures related to environme	ental emissions from industrial sites			
Onsite pre-treatment of waste water	Not applicable.			
Resulting fraction of initially applied amount in waste water released from site to the external				
sewage system	Not applicable.			
Air emission abatement	Not applicable.			
Resulting fraction of applied amount in waste gas	Open is the text			
released to environment	Not applicable.			
Onsite waste treatment Fraction of initially applied amount sent to	Not applicable.			
external waste treatment. This is the sum of direct losses from processes to waste, and the residues				
from onsite waste water and waste gas treatment. Municipal or other type of external waste water	Not applicable. Yes			
Effluent (of the waste water treatment plant)	2000 m ³ /d			
discharge rate				
Recovery of sludge for agriculture or horticulture	Yes			
2.3 Control of consumer exposure				
Consumer exposure is not relevant for this scenario.				
Section 3: Exposure estimation Section 3.1 Health				
Section 3.1 Health				

	al exposure			12	200 (PROC8b, in absence of LEV)					
(in μg/cm²					A ZARNACI IS					
		ire via contact with	1	(0.7 (PROC4)					
substance a										
(in mg/kg l				-	A V. 1944 A VII					
		ire via aqueous sol	ution	10).07 (PROC4)					
in mg/kg bw/d) nhalation exposure				1	Vagligikla Com	contributing tasks th	nat do not in-	lva bardlinP -		
maranon	exposure									
					products leading to evolution of dusts, or spraying of liquid product See also below					
Inhalation	exposure					ssuming any solids	are processed o	nly in a closed		
(in mg/m³)/8h workday					ystem.	3,	m o processor o	m, m a crosca		
(refers only to any contributing tasks involving handling of solid products leading to evolution of										
					i) 1.8 (PROC8	a, 8b).(LEV but no	PPE)			
dusts)										
Inhalation exposure					/a					
(in mg/m³)/8h workday refers only to any contributing tasks involving										
	to any contr Tiquid produ		ving							
		acterisation for w	nrkers							
Quantituti	Route	exposure	Leadin	17	DN(M)EL	Risk	DN(M)EL	Risk		
	assum:	concentrations	toxic	6	(ECHA)	characterisation	(ECETOC)	characterisatie		
		(EC)	end		(22 (22.2)	ratio	(500)	ratio		
			point	1						
			Critica	ıl						
			effect							
Acute -	Dermal	mg/cm ² *	Skin		Not	2	Not	=		
local effects			and/or		relevant		relevant			
			eye irritatio	un.						
	Inhalation	mg/m³	no data	_	Not	_	Not	-		
			Tro data		relevant		relevant			
Acute -	Dermal	mg/kg bw/d	Repeate	ed	Not		Not			
systemic			dose Repeated		quantified		quantified			
effects	Inhalation	mg/m ³ **			Not		Not			
			dose		quantified		quantified			
	Combined					RCR Inhalation-		RCR Inhalation		
	routes					systemic + RCR	e Arcar	systemic + RC		
					19 14. d.	Dermal-		Dermal-		
Long-	Dermal	mg/cm²/d	Skin	OVII.	Not	systemic	Not	systemic		
term –	Level Hilli	mg/sm /d	and/or		relevant	112	relevant			
local			eye		. C. C. MIII		ACIONEIII			
effects			irritatio	n						
	Inhalation	mg/m ³ ***	no data		Not	(a)	Not	E .		
					relevant		relevant			
Long-	Dermal ^a		Repeate	ed	1.3 - 2.0	0.54	6.5 - 10.0	0.11		
term -			dose		mg/kg		mg/kg bw/d			
systemic effects	Inhalation		D		bw/d 4.6 - 7.2	0.20	23 - 36	0.08		
2110013	mandion		Repeate dose	D	mg/m^3	0.39	23 - 36 mg/kg bw/d	0.08		
	Combined	71	4030	ă.	mg/ m	0.93. Acceptable	mg/kg ow/u	0.19. Acceptable		
	routes					risk		risk		
Section 3.1	Environmen	nt .				10 (10 C PM)		HOME TO THE THE THE THE THE THE THE THE THE THE		
Air Release				Ir	view of the	low volatility of i	iron salts it is	not envisaged t		
					leases to air a					
Aquatic Rel) kg Fe/d					
Soil Release	3			0						
5080 In 1779	cterisation									

Compartments		PEC	PNEC	PEC/PNEC	Discussion
Surface water	mg/l			9	¥
Freshwater sedim	ent	45.0 mg/k dw	g 49.5 mg/kg dw	0.909	The PEC associated with production is less than the indicative PNEC, resulting in a PEC/PNEC ratio of 0.909. Conclusion: acceptable risk.
Risk characterisation	n for t	the terrestria	l compartment		
Compartments	PE	C	PNEC	PEC/PNEC	Discussion
Industrial soil	50.1 dw	8 mg/kg	55.0 mg/kg dw	0.924	The PEC associated with production results in a PEC/PNEC ratio of 0.924. Conclusion: acceptable risk.
Atmospheric compa	rtmen	nt			
No basis for risk cha	iracte	risation. Not	t applicable		
Section 4: Guidanc	e to I	OU to check	cown condition	ns	
Not available					
	repor the ex	ted in this so posure scen	ection have not		account in the exposure
Not available					

ES 7. MANUFACTURE OF CEMENT				
Section 1				
Exposure Scenario Title				
Title	Manufacture of cement			
Use Descriptor	SU3, 8, 13			
Process Categories and Environmental Release	PROC 3, 4, 5, 8a, 8b, 9, 14			
Categories	ERC 2			
Processes, tasks, activities covered	PROC3 Use in closed batch process (s PROC4 Use in batch and other process for exposure arises PROC5 Mixing or blending in batch preparations and articles (multistage and/or significant contact) PROC8b Transfer of substance or pre- from/to vessels/large containers at dedicated facilities PROC8a Transfer of substance or pre- from/to vessels/large containers at non-dedicated facilities PROC9 Transfer of substance or pre- (dedicated filling line, including weight PROC14 Production of preparations compression, extrusion, Palletisation	h processes for formulation of eparation (charging/discharging) eparation (charging/discharging) eparation into small containers ing)		
	ERC2 Formulation of preparations			
Section 2				
Operational conditions and risk management me	easures			
Section 2.1 Control of worker exposure	10. 30. 300 0 02.00			
(PROC 3, 4, 5, 8a, 8b, 9, 14)				
Product characteristics				
Physical form of product	Liquid (aqueous solution) or Soli	id salts (assumed to be in		
	granular/flake form rather than powder			
Concentration of substance in	No data			
product	5,500,500,500			
Amounts used	Used amount of substance per day: 4.1	1 t Fe/d		
	Annual amount used per site: approx. I			
Frequency and duration of use	Daily, up to 8 hours	1130 (103)		
Operational conditions related to available diluti		and humans		
Respiration volume under conditions of use	10 m ³ /d	osed numans		
Area of skin contact with the substance under		PD 0.02		
conditions of use	240	(PROC3)		
conditions of use		C8b, PROC9, PROC14)		
Payly maight	960 (PROC8a)			
Body weight	70 kg			
Risk management measures				
Containment and lead or house the start		*/		
Containment and local exhaust ventilation	Containment plus good work practice required	Yes		
	Local ashauet contilation required	No		
	Local exhaust ventilation required	110		
B 1	plus good work practise	3003-50		
Personal protective equipment (PPE)	plus good work practise Skin protection	Protective gloves		
Personal protective equipment (PPE)	Plus good work practise Skin protection Eye protection	Protective gloves Safety glasses		
Personal protective equipment (PPE)	plus good work practise Skin protection	Protective gloves Safety glasses Working clothing worn.		
Personal protective equipment (PPE)	Plus good work practise Skin protection Eye protection	Protective gloves Safety glasses Working clothing worn. If handling solid salts, Filter mask P2 (FFP2) must be used, in the absence of LEV		
	Plus good work practise Skin protection Eye protection Clothing	Protective gloves Safety glasses Working clothing worn. If handling solid salts, Filter mask P2 (FFP2) must be		
Personal protective equipment (PPE) Other risk management measures related to workers	plus good work practise Skin protection Eye protection Clothing Respiratory protection	Protective gloves Safety glasses Working clothing worn. If handling solid salts, Filter mask P2 (FFP2) must be used, in the absence of LEV		

	auditing systems	maintained and cleaned daily.			
	Precautions against irritation	As necessary			
Waste related measures	Any solid wastes are ultimately assumed to be disposed of via landfill or incineration.				
Human factors not influenced by	Not available				
risk management					
2.2 Control of environmental exposure (ERC 2)					
Product characteristics					
Physical form of product	Liquid (aqueous solution) or granular/flake form rather than pos	Solid salts (assumed to be in wdered)			
Concentration of substance in product	No data				
Amounts used	4.1 t Fe/day) Used amount of substance per day Annual amount used per site: appr				
Frequency and duration of use	Emission days per site 350 d/y				
Operational conditions of use					
Fraction of applied amount lost from process/use to waste gas	0				
Fraction of applied amount lost from process/use to waste water	2.00E-05				
Risk management measures related to environment	ental emissions from industrial sit	es			
Onsite pre-treatment of waste water	Not applicable.				
Resulting fraction of initially applied amount in waste water released from site to the external					
sewage system	Not applicable.				
Air emission abatement	Not applicable.				
Resulting fraction of applied amount in waste gas					
released to environment		Not applicable.			
Onsite waste treatment	Not applicable.				
Fraction of initially applied amount sent to external waste treatment. This is the sum of direct losses from processes to waste, and the residues					
from onsite waste water and waste gas treatment.	Not applicable.				
Municipal or other type of external waste water treatment	Yes				
Effluent (of the waste water treatment plant) discharge rate	2000 m ³ /d				
Recovery of sludge for agriculture or horticulture	Yes				
2.3 Control of consumer exposure					
Consumer end use of cement is assessed under ES 9)e				
Section 3: Exposure estimation	×				
Section 3.1 Health					

Dermal loc (in µg/em²	al exposure			400	400 (PROC5, in absence of LEV)					
	stemic exposi	ure via contact with	1	0.7 (0.7 (PROC4)					
(in mg/kg l	ow/d)									
Dermal sys		ure via aqueous sol	ution	0.07	(PROC4)					
Inhalation				Neo	igible for	contributing tasks ti	ant do not invo	lve handling of se		
				prod	ucts leadir also below	ng to evolution of du	ists, or spraying	of liquid produc		
Inhalation	exposure			i) 1.8	PROC8:	a, 8b).(LEV but no I	PPE)			
	8h workday			ii)	2.01 (PR	OC8a, 8b). Con	tainment and	mechanical/natu		
handling o		ributing tasks involutes leading to evolu		expo	sure and r	d PPE (Filter mask manage risks, Equip				
dusts)				clear	ned daily.					
Inhalation				n/a						
	/8h workday	ributing tasks invol								
spraying of	liquid produ	acterisation for w								
Quantitati	Route	exposure		- D	N(M)EL	D:-I-	DAVADEL	n' i		
	Route	concentrations	Leadin toxic		ECHA)	Risk characterisation	DN(M)EL (ECETOC)	Risk characterisatio		
		(EC)	end	(1	(CIIA)	ratio	(ECEIOC)	ratio		
			5000000	1		1 4440		1400		
			Critica effect	ıl						
Acute -	Dermal	mg/cm ²	Skin	N	ot	-	Not	-		
local		1	and/or	re	levant		relevant			
effects				11						
	Inhalation	mg/m³	no data		ot levant	-	Not relevant	~		
Acute -	Dermal	mg/kg bw/d	Repeate				Not			
systemic			dose		antified		quantified			
effects	Inhalation	mg/m³	Repeate	-			Not			
			dose		antified		quantified			
	Combined		从基 户			RCR Inhalation-	10 GP-10	RCR Inhalation		
	routes					systemic + RCR		systemic + RC		
						Dermal-		Dermal-		
r	6 1	BULLER FOR THE	THE REPORT		The Stellar	systemic	TA TOURS IN	systemic		
Long- term –	Dermal	mg/cm ² /d	Skin	N		=	Not			
local			and/or	re	levant		relevant			
effects		2.5	eye irritatio	n						
	Inhalation	mg/m³	no data	N	ot levant	-	Not relevant	-		
Long-	Dermal ^a		Repeate		3 - 2.0	0.54	6.5 - 10.0	0.11		
term - systemic			dose	m	g/kg v/d	Source (IA) UV	mg/kg bw/d			
effects	Inhalation		Repeate dose	ed 4.	6 - 7.2 g/ m ³	0.43	23 - 36 mg/kg bw/d	0.09		
	Combined routes					0.97. Acceptable risk		0.20. Acceptabl		
	Environme									
	fore WWTP)		0.08	kg/d					
Air (direct				0						
	releases only	/)		0						
kisk chara	cterisation									

Compartments	PEC	PNEC	PEC/PNEC	Discussion
Surface water	2.4E-06 mg/l		=	-
Freshwater sedim	ent 45.0 mg/kg dw	49.5 mg/kg dw	0.909	The PEC associated with production is less than the indicative PNEC, resulting in a PEC/PNEC ratio of 0.909. Conclusion: acceptable risk.
isk characterisation	for the terrestrial	compartment		
Compartments	PEC	PNEC	PEC/PNEC	Discussion

The PEC associated with production results in a

PEC/PNEC ratio of 0.909. Conclusion:

acceptable risk.

Atmospheric compartment

No basis for risk characterisation. Not applicable

dw

Section 4: Guidance to DU to check own conditions

Not available

Additional good practice advise beyond CSA

Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in

dw

Article 37 (4) of REACH

ES 8. INDUSTRIAL USE OF CEMENT							
Section 1 Exposure Scenario Title							
Title	Industrial use of cement						
Use Descriptor							
	SU 3, 19						
Process Categories and Environmental Release Categories	PROC 5, 8b, 8a, 10 ERC 5, 8f, 10a						
Processes, tasks, activities covered	PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a Transfer of substance or preparation (charging/discharging from/to vessels/large containers at non dedicated facilities PROC8b Transfer of substance or preparation (charging/discharging from/to vessels/large containers at dedicated facilities PROC10 Roller application or brushing ERC5 Industrial use resulting in inclusion into or onto a matrix ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC10a Wide dispersive outdoor use of long-life articles an						
0 3	materials with low release						
Section 2							
Operational conditions and risk management me	easures						
Section 2.1 Control of worker exposure (PROC 5, 8b, 8a, 10)							
Product characteristics							
Physical form of product	Liquid (aqueous solution) or Solid salts (assumed to be granular/flake form rather than powdered)						
Concentration of substance in product	No data						
Amounts used	Used amount of substance per day: 40 tonnes cement mix containin 200 kg iron salt (approx. 80 kg Fe) Annual amount used per site: approx. 24 T Fe/y						
Frequency and duration of use	Daily, up to 8 hours						
Operational conditions related to available diluti		osed humans					
Respiration volume under conditions of use	10 m ³ /d	V. V. V. V					
Area of skin contact with the substance under conditions of use	480 (PROC5, PROC8b						
Body weight	960 (PROC8a, PROC10) 70 kg						
Risk management measures	70 kg						
It is noted that the hazards associated with other co than the iron salts. PPE and other risk management possible risks from iron salts. In view of the oth necessary and/or already in place. Containment and local exhaust ventilation	measures mentioned here refer only to	measures necessary to manage					
	Local exhaust ventilation required plus good work practise	No					
Personal protective equipment (PPE)	Skin protection	Protective gloves					
	Eye protection	Safety glasses					
	Clothing	Working clothing worn.					
	Respiratory protection	If handling solid salts, Filte mask P2 (FFP2) must bused, in the absence of LEV					
	Breathing apparatus	None					
Other risk management measures related to workers	Procedural and control technologies	If handling solid salts, LEV OR containment and					

		ventilation must be available.			
	Training. Monitoring/reporting and	Equipment must be wel			
	auditing systems	maintained and cleaned daily			
W. T. T. T. T. T. T. T. T. T. T. T. T. T.	Precautions against irritation	As necessary			
Waste related measures	Any solid wastes are ultimately assumed to be disposed of via landfi or incineration.				
Human factors not influenced by	Not available				
risk management					
2.2 Control of environmental exposure (ERC 5, 8	Sf, 10a)				
Product characteristics					
Physical form of product	Liquid (aqueous solution) or Soli- granular flake form rather than powder				
Concentration of substance in product	No data				
Amounts used	40 t cement mix containing 200 kg iron	salt (approx. 80 kg Fe)			
	Used amount of substance per day: 4				
	kg iron salt (approx. 80 kg Fe)				
	Annual amount used per site: approx. 2	4 T Fe/v			
Frequency and duration of use	Emission days per site 300 d/y	4			
Operational conditions of use					
Fraction of applied amount lost from process/use	0				
to waste gas	77				
Fraction of applied amount lost from process/use	0.002	0.00			
to waste water					
Risk management measures related to environm	ental emissions from wide dispersive p	rofessional use			
, and the same of	1	and the state of t			
Onsite pre-treatment of waste water	Not applicable.				
Resulting fraction of initially applied amount in	A.4				
waste water released from site to the external					
sewage system	Not applicable.				
Air emission abatement	Not applicable.				
Resulting fraction of applied amount in waste gas					
released to environment	Not applicable.				
Onsite waste treatment	Not applicable.				
Fraction of initially applied amount sent to					
external waste treatment. This is the sum of direct					
losses from processes to waste, and the residues					
from onsite waste water and waste gas treatment.	Not applicable.				
Municipal or other type of external waste water	Yes				
treatment	6 FF0				
Effluent (of the waste water treatment plant)	2000 m ³ /d				
discharge rate					
Recovery of sludge for agriculture or horticulture	Yes				
2.3 Control of consumer exposure					
Professionals and consumers assessment is set out in	n ES9b and 9c respectively				
Section 3: Exposure estimation					
Section 3.1 Health					
Dermal local exposure	200 (PROC8b, in absence of LEV)				
(in μg/cm ²)	(,				
Dermal systemic exposure via contact with	0.6 (PROC10)				
substance as such	-18 (1 at 9 a a 9)				
(in mg/kg bw/d)					
Dermal systemic exposure via aqueous solution (in mg/kg bw/d)	0.06 (PROC10)				
Inhalation exposure	Negligible for contributing tasks that do not involve handling of solid products leading to evolution of dusts, or spraying of liquid product See also below				
Inhalation exposure	i) 1.8 (PROC8a, 8b).(LEV but no PPE)				
	ii) 2.01 (PROC8a, 8b). Containment and	d mechanical/natural			
(in mg/m²)/8h workday	H) Z.U1 (FROCOL OD), Containment and				
(in mg/m³)/8h workday (refers only to any contributing tasks involving handling of solid products leading to evolution of	ventilation; and PPE (Filter mask P2 (F.	FP2)) must be used to limit			

dusts) Inhalation (exposure						leaned daily. /a			
in mg/m³).	8h workd to any co	ntrib	outing tasks i	nvol	ving					
Quantitati	ve risk ch	arac	terisation f	or w	orkers					
	Route		exposure concentrati (EC)	ons	Leadin toxic end point Critica effect	7	DN(M)EL (ECHA)	Risk characterisation ratio	DN(M)EL (ECETOC)	Risk characterisatio ratio
Acute - local effects	Dermal	8	mg/cm²		Skin and/or eye irritation		Not relevant		Not relevant	-
	Inhalatio	n	mg/m³		no data		Not relevant	-	Not relevant	99
Acute - systemic	Dermal		mg/kg bw/d		Repeate	ed	Not quantified		Not quantified	
effects	Inhalatio	n i	mg/m³		Repeate dose	ed	Not quantified	(ac	Not quantified	
	Combine	ed						RCR Inhalation- systemic + RCR Dermal- systemic		RCR Inhalation systemic + RC Dermal- systemic
Long- term – local effects	Dermal		mg/cm ² /d		Skin and/or eye irritation		Not relevant	-	Not relevant	-
	Inhalatio	n	mg/m³		no data		Not relevant		Not relevant	3 11
Long- term - systemic	Dermal ^a				Repeated dose		1.3 - 2.0 mg/kg bw/d	0.46	6.5 - 10.0 mg/kg bw/d	0.09
effects	Inhalatio	n			Repeated dose		4.6 - 7.2 mg/ m ³	0.43	23 - 36 mg/kg bw/d	0.09
	Combine routes	ed			ta privile Major			0.89. Acceptable risk		0.18. Acceptabl
Section 3.1										
Aquatic (be		(P)					.16 kg/d			
Air (direct - Soil (direct		n Lui				0				
Risk chara						U	1			
Aquatic con	npartment	(incl	luding sedin	ient)						
Compart	ments		PEC		NEC		PEC/PNEC	Discussion		
Surface w			2.4E-06 mg/l				2	-		
			m	9.5 g/kg dw		0,909	The PEC associate the indicative PN ratio of 0.909. Co	EC, resulting in	n a PEC/PNEC	
			ne terrestrial							
Compart		PEC		PNE			EC/PNEC	Discussion		
Industrial	soil	50.0 dw	0.0 mg/kg 55 mg/kg dw		0.909		The PEC associated with production results in a PEC/PNEC ratio of 0,909. Conclusion: acceptable risk.			
Atmospheri Jo basis for			isation. Not	appli	cable					

Additional good practice advise beyond CSA

Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH Not available

EO Y LINOT EDDIOTAL AND	CONSUMER USE OF CEMENT							
Section 1								
Exposure Scenario Title								
Title	Professional and consumer use of cement							
Use Descriptor	SU 13, 21, 23							
Process Categories and Environmental								
Release	ERC 8f, 10a, 8c							
Categories								
Processes, tasks, activities covered	PROC5 Mixing or blending in batch processes	for formulation of preparation						
	and articles							
	(multistage and/or significant contact)							
	PROC8a Transfer of substance or preparation	(charging/discharging) from/to						
	vessels/large							
	containers at non dedicated facilities							
	PROC8b Transfer of substance or preparation	(charging/discharging) from/to						
	vessels/large							
	containers at dedicated facilities							
	PROC10 Roller application or brushing							
	PROC19 Hand-mixing with intimate contact ar	nd only PPE available						
	PROC26 Handling of solid inorganic substance	es at ambient temperature						
	ERC8c Industrial use of monomers for manufa-							
	ERC8f Wide dispersive outdoor use resulting	g in inclusion into or onto a						
	matrix	***						
	ERC10a Wide dispersive outdoor use of long life articles and materials with							
Section 2	low release							
Operational conditions and risk mana	gement measures							
Section 2.1 Control of worker exposur	-e							
(PROC 5, 8b, 8a, 10)								
Product characteristics	Tet the second of the second o							
Physical form of product	Liquid (aqueous solution) or Solid salts (assum	ied to be in granular/flake form						
Caracatan	rather than powdered)							
Concentration of substance in product	No data							
A CONTRACTOR OF THE PROPERTY O		200-200 AU-00AV						
Amounts used	Head amount of substance (as such as in arone	wo ti an V man arrantan Francisco a a a						
Amounts used	Used amount of substance (as such or in prepa	ration) per worker [workplace]						
Amounts used	per day: 8.3 t cement mix containing approx	ration) per worker [workplace] 41 kg iron salt (approx. 17 kg						
Amounts used	per day: 8.3 t cement mix containing approx Fe)	ration) per worker [workplace] 41 kg iron salt (approx. 17 kg						
	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y	ration) per worker [workplace] 41 kg iron salt (approx. 17 kg						
Frequency and duration of use	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours	41 kg iron salt (approx. 17 kg						
Frequency and duration of use Operational conditions related to avai	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e	41 kg iron salt (approx. 17 kg						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours	41 kg iron salt (approx. 17 kg						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e	41 kg iron salt (approx. 17 kg						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m ³ /d 480 cm ² (PRO	41 kg iron salt (approx. 17 kg xposed humans C5, PROC8B)						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 960 cm² (PROC	41 kg iron salt (approx. 17 kg xposed humans C5, PROC8B)						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance under conditions of use	per day: 8.3 t cement mix containing approximely Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (PRO	41 kg iron salt (approx. 17 kg xposed humans C5, PROC8B)						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm²)) 70 kg	41 kg iron salt (approx. 17 kg xposed humans C5, PROC8B)						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance under conditions of use	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm²)) 70 kg	41 kg iron salt (approx. 17 kg xposed humans C5, PROC8B)						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for wide of	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (PROC19, assumed to apply for 26) 70 kg dispersive use	xposed humans C5, PROC8B) R8A, PROC10)						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for wide of It is noted that the hazards associated v	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (PROC19, assumed to apply for 26) 70 kg dispersive use	xposed humans C5, PROC8B) C8A, PROC10) anticipated to be significantly						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for wide of It is noted that the hazards associated worse than the iron salts. PPE and other	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC) 70 kg dispersive use	xposed humans C5, PROC8B) C8A, PROC10 anticipated to be significantly only to measures necessary to						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for wide of It is noted that the hazards associated was worse than the iron salts. PPE and other manage possible risks from iron salts. In	per day: 8.3 t cement mix containing approx Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (PROC19, assumed to apply for 26) 70 kg dispersive use	xposed humans C5, PROC8B) C8A, PROC10 anticipated to be significantly only to measures necessary to						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for wide of It is noted that the hazards associated was worse than the iron salts. PPE and other manage possible risks from iron salts. In be necessary and/or already in place.	per day: 8.3 t cement mix containing approximately Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC19, assumed to apply for 26) 70 kg dispersive use with other constituents of cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements.	xposed humans C5, PROC8B) E8A, PROC10) anticipated to be significantly only to measures necessary to the tents more rigorous RMM may						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for wide of It is noted that the hazards associated was worse than the iron salts. PPE and other manage possible risks from iron salts. In be necessary and/or already in place. Containment and local exhaust	per day: 8.3 t cement mix containing approximately Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 960 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC) 70 kg dispersive use with other constituents of cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements of the other constituents of the o	xposed humans C5, PROC8B) R8A, PROC10) anticipated to be significantly only to measures necessary to						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for wide of It is noted that the hazards associated was worse than the iron salts. PPE and other manage possible risks from iron salts. In be necessary and/or already in place. Containment and local exhaust	per day: 8.3 t cement mix containing approximately Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC19, assumed to apply for 26) 70 kg dispersive use with other constituents of cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements of the other constituents of formulated cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements are generally risk management measures mentioned here refer view of the other constituents of the other constituents of the other constituents of the other constituents of the other constituents of the other constituents of the other constituents of the other constituents of the other constituents of the other constituents of the other constituents of the other constituents of the other constituents of the other constituents of t	xposed humans C5, PROC8B) E8A, PROC10) anticipated to be significantly only to measures necessary to ments more rigorous RMM may						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for wide of It is noted that the hazards associated was worse than the iron salts. PPE and other manage possible risks from iron salts. In be necessary and/or already in place. Containment and local exhaust	per day: 8.3 t cement mix containing approximately Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm²	xposed humans C5, PROC8B) E8A, PROC10) anticipated to be significantly only to measures necessary to the tents more rigorous RMM may						
Frequency and duration of use Operational conditions related to avail Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for wide of the interest of the inter	per day: 8.3 t cement mix containing approximately Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (P	xposed humans C5, PROC8B) anticipated to be significantly only to measures necessary to nents more rigorous RMM may Yes No						
Frequency and duration of use Operational conditions related to avail Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for wide of the interest of the inter	per day: 8.3 t cement mix containing approximately Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC) 70 kg dispersive use with other constituents of cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements of the other constituents of the other constituents of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of t	xposed humans C5, PROC8B) anticipated to be significantly only to measures necessary to nents more rigorous RMM may Yes No Protective gloves.						
Frequency and duration of use Operational conditions related to avai Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for wide of It is noted that the hazards associated was worse than the iron salts. PPE and other manage possible risks from iron salts. In be necessary and/or already in place. Containment and local exhaust ventilation Personal protective equipment	per day: 8.3 t cement mix containing approximate) Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (PRO	xposed humans C5, PROC8B) C8A, PROC10) anticipated to be significantly only to measures necessary to nents more rigorous RMM may Yes No Protective gloves. Safety glasses						
Frequency and duration of use Operational conditions related to avail Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for wide of the interest of the inter	per day: 8.3 t cement mix containing approximately Fe) Annual amount used per site: 5.1 T Fe/y Daily, up to 8 hours lable dilution capacity and characteristics of e 10 m³/d 480 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC 1980 cm² (PROC) 70 kg dispersive use with other constituents of cements are generally risk management measures mentioned here refer view of the other constituents of formulated cements of the other constituents of the other constituents of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of the other center of t	xposed humans C5, PROC8B) C8A, PROC10) anticipated to be significantly only to measures necessary to nents more rigorous RMM may Yes No Protective gloves.						

		mask P2 (FFP2) must be				
	Dearth in a comparation	used				
Other risk management measures	Breathing apparatus	None				
related to workers	Procedural and control technologies	If handling solid salts, containment and ventilation must be available.				
	Training. Monitoring/reporting and auditing systems	Equipment must be well maintained and cleaned daily.				
	Precautions against irritation	As necessary				
Waste related measures	Any solid wastes are ultimately assumed to incineration.	be disposed of via landfill or				
Human factors not influenced by risk management	Not available					
2.2 Control of environmental exposure	e (ERC 5, 8f, 10a)					
Product characteristics	and the second of the second o					
Physical form of product	Liquid (aqueous solution) or Solid salts (assume rather than powdered)	ed to be in granular/flake form				
Concentration of substance in product	No data					
Amounts used	Amount per day comsumer: 2.5 t cement mix containing 12 kg iron salt (approx. 5 kg Fe) Amount per day Professional use – small-scale: 8.3 t cement mix containing approx 41 kg iron salt (approx. 17 kg Fe) Annual amount used per site: 5.1 T Fe/y					
Frequency and duration of use	Emission days per site: 365 d/y (consumer), 300	d/v (worker)				
Operational conditions of use	, , , , , , , , , , , , , , , , , , , ,	<i>a y</i> (<i>o</i> ; <i>o</i> ; <i>y</i>				
Fraction of applied amount lost from process/use to waste gas	0					
Fraction of applied amount lost from process/use to waste water	n 0.02					
Risk management measures related to	environmental emissions from wide dispersive	professional use				
Onsite pre-treatment of waste water	Not applicable.					
Resulting fraction of initially applied amount in waste water released from	**					
site to the external sewage system	Not applicable.					
Air emission abatement	Not applicable.					
Resulting fraction of applied amount						
	Not applicable.					
Onsite waste treatment	Not applicable.					
Fraction of initially applied amount sent to external waste treatment. This is the sum of direct losses from processes to waste, and the residues from onsite waste water and waste gas						
treatment.	Not applicable.					
Municipal or other type of external waste water treatment	Yes					
Effluent (of the waste water treatment plant) discharge rate	2000 m ³ /d					
Recovery of sludge for agriculture or horticulture	Yes					
2.3 Control of consumer exposure						
Product characteristics						
Physical form of product	Liquid (aqueous solution) or Solid salts (assume	d to be in granular/flake form				
Concentration of substance in	rather than powdered) No data					
Amounts used	Used amount of substance per day: 8.3 t cement iron salt (approx. 17 kg Fe) Annual amount: approx. 900 t/y	mix containing approx 41 kg				

(

Frequency and duration of use	y and duration of use Daily, up to 8 hours.					
Risk management measures related to	o consumers' use					
worse than the iron salts. PPE and other	with other constituents of cements are general risk management measures mentioned here reason view of the other constituents of formulated	efer only to measures necessary to				
Personal protective equipment (PPE) required under regular conditions of consumer use	None					
Instructions addressed to consumers	As necessary, consumers should be advised to avoid contact with skin/of and/or to Use suitable protection					
Risk management measures related to emissions to the environment	Municipal or other type of waste water treatment	Yes				
	Effluent (of the waste water treatment plant) discharge rate	2,000 m ³ /d				
Section 3: Exposure estimation						
Section 3.1 Health						
Worker use						
Dermal local exposure (in μg/cm²)	osure 400 (PROC5, in absence of LEV)					
Dermal systemic exposure via contact with substance as such (in mg/kg bw/d)	0.27 (PROC2, 8b)					
Dermal systemic exposure via aqueous solution (in mg/kg bw/d)	0.027 (PROC2, 8b)					
Inhalation exposure	Negligible for contributing tasks that do products leading to evolution of dusts, See also below	not involve handling of solid or spraying of liquid product				
Inhalation exposure (in mg/m³)/8h workday (refers only to any contributing tasks involving handling of solid products leading to evolution of dusts)	 2.0 (PROC8a, 8b; handling solids indoors). Containment and mechanical/natural ventilation; and PPE (Filter mask P2 (FFP2)) must be used to limit exposure and manage risks. Equipment must be well maintained and cleaned daily. 2.2 (PROC8a, 8b; handling solids outdoors). mechanical/natural ventilation; and PPE (Filter mask P2 (FFP2)) must be used to limit exposure and manage risks. Equipment must be well maintained and cleaned daily. 					
Inhalation exposure (in mg/m³)/8h workday (refers only to any contributing tasks involving spraying of liquid product)	n/a	an reference to the second by the				

	cal exposure		250						
(in μg/cm ⁻									
Dermal sy in mg/kg	stemic expo bw/d)	sure	6.8E-05 (mixing stage i.e. exposure to substance as such)						
Indon'totious	200		≤0.017 (ap	plication stag	te i.e. once prepared	as an aqueous	mix)		
Inhalation	exposure		products 1 See also be	eading to e	uting tasks that divolution of dusts.	o not involve or spraying	handling of s of liquid prod		
nhalation	exposure		1.1 (handl	ing indoors).	Mechanical/natura	L ventilation 5	should be availa		
in mg/m³)	/day ⁴		Assumes E	xposure dura	tion up to 2 h/d and ild be advisable if s	1.1 d/w			
nvolving l	nandling of s	cributing tasks solid products		er durations o					
nhalation	evolution of	dusts)	w/s						
in mg/m ³)			n/a						
		tributing tasks iquid product)							
in μg/cm ²			250						
Quantitati		racterisation for v		,					
	Route	exposure concentration s (EC)	Leading toxic end point /	DN(M)E L (ECHA)	Risk characterisatio n ratio	DN(M)EL (ECETOC)	Risk characterisati n ratio		
			Critical effect						
Acute - local effects	Dermal	mg/cm ²	Skin and/or eye	Not relevant	120	Not relevant			
0110013			irritation						
	Inhalatio n	mg/m³	no data	Not relevant	-	Not relevant	-		
Acute - systemi	Dermal	mg/kg bw/d	Repeate d dose	Not quantified		Not quantified			
e effects	Inhalatio n	mg/m³	Repeate d dose	Not quantified		Not quantified			
	Combine d routes				RCR Inhalation- systemic + RCR Dermal- systemic		RCR Inhalatio systemic + RC Dermal- systemic		
Long- term – local effects	Dermal	mg/cm ² /d	Skin and/or eye irritation	Not relevant		Not relevant	-		
	Inhalatio n	mg/m³	no data	Not relevant	*	Not relevant	=		
Long- term - systemi	Dermal		Repeate d dose	1.3 - 2.0 ing/kg bw/d	0.21	6.5 - 10.0 mg/kg bw/d	0.04		
c effects	Inhalatio n		Repeate d dose	4.6 - 7.2 mg/ m ³	0.48	23 - 36 mg/kg bw/d	0.10		
	Combine d routes				0.69. Acceptable risk		0.14. Acceptable risi		
uantitati	ve risk char	acterisation for c	onsumers						
	Route	exposure concentration s (EC)	Leading toxic end	DN(M)E L (ECHA)	Risk characterisatio n ratio	DN(M)EL (ECETOC	Risk characterisati n ratio		

	(and				point Critical effect				
Acute - local effects	Derma	0	.25 mg/c	n-×	Skin and/or eye irritation	Not relevant	Refer to qualitative risk characterisation below	relevant	Refer t qualitative ris characterisation below
	Inhala n	tio n	ig/m³		no data	Not relevant	-	Not relevant	(a)
Acute - systemi e effects	Derma		017 m w/d	g kg	Repeate d dose	0.7 - 1.0 mg/kg bw/d		3.5 - 5.0 mg/kg bw/d	
	Inhala n	io 1.	l mg/m²	**	Repeate d dose	1.1 - 1.5 mg/ m ³		5.5 - 7.5 mg/m ³	
	Combi d route						<1. Acceptable		<0.2. Acceptable risk
Long- term - local effects	Derma		g/cm²/d		Skin and/or eye irritation	Not relevant	Refer to qualitative risk characterisation below		Refer t qualitative ris characterisation below
	Inhalat n	io m	g/m³ ***		no data	Not relevant	-	Not relevant	W
Long- term - systemi	Derma]4 <	0.02		Repeate d dose	0.7 - 1.0 mg/kg bw/d	<0.03	3.5 - 5.0 mg/kg bw/d	<0.006
e effects	Inhalat n	d1	1 (withoust mask 59 (with ask)		Repeate d dose	1.1 - 1.5 mg/ m ³	1 (no dust mask) 0.54 (with dust mask)	5.5 - 7.5	0.2
	Combi d route	s					Limit of acceptable risk without dust mask		0.2. Acceptabl
Section 3.1 Aquatic (be					0.1 kg/d	(consumer)			
						d (professio	nal)		
Air (direct					0				
Soil (direct Risk chara		ion			0				
Aquatic con			uding sec	limer	11)				
Comparti			EC	_	NEC	PEC/PNEC	Discussion		
Surface wa	iter	1000	4E-06				-		
Freshwate		d		11	9.5 ng/kg dw	0.909	the indicative I	The PEC associated with production is less that the indicative PNEC, resulting in a PEC/PNEC ratio of 0.909. Conclusion: acceptable risk.	
			e terrestr		mpartmen				
Comparti		PEC		PNE		PEC/PNEC	Discussion	01 (04)	1. 1.
		dw dw	ng/kg	10.01		The PEC associated with production results in a PEC/PNEC ratio of 0.91. Conclusion: acceptabrisk.			
Atmospher									
No basis for section 4: Not availab	Guidan	aracteri ce to Dt	sation. N J to che	ot ap	plicable vn conditi	ons			
dditional lote: The r	good pi	reporte	d in this	section	on have no	t been taken in	to account in the e	xposure	
simmatee re			CONTRACTOR STATE	THE PERSON	CONTRACTOR TO PERSON	THE WATER PARTY CALLS	THE PERSON OF TH	LLC 1 (17) (3/3/23 173	

ES 10. PROFESSIONAL USI	E IN LAND REMEDIATION APPLICATIONS
Section 1 Exposure Scenario Title	
Title	Professional use in land remediation applications
Use Descriptor	SU 19, 22
Process Categories and Environmental Release Categories	
Processes, tasks, activities covered	PROC2 Use in closed, continuous process with occasional controlled exposure PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities

	PROC8b Transfer of substance or preparation (charging discharging) from/to vessels/large containers at dedicated facilities ERC8e Wide dispersive outdoor use of reactive substances in open systems						
Section 2							
Operational conditions and risk ma	nagement measures						
Section 2.1 Control of worker expos	sure						
(PROC 2, 8a, 8b)							
Product characteristics							
Physical form of product	Liquid (aqueous solution) or Solid salts (assum	ed to be in granular/flake form					
	rather than powdered)						
Concentration of substance in	No data						
product							
Amounts used	Used amount of substance (as such or in preparation) per worker [workplace per day: Approx. 400 kg Fe/d Annual amount used per site: Approx. 100 tonnes of iron salt, containing approximately 40 tonnes Fe						
Frequency and duration of use	Daily, up to 8 hours						
Operational conditions related to av	vailable dilution capacity and characteristics of	exposed humans					
Respiration volume under conditions	10 m³/d	200 In 1970 To 17 (17 To 17 Th					
of use							
Area of skin contact with the	480 cm ² (PRO	C2. PROC8b)					
substance under conditions of use	960 cm ² (PROC8A)	110000)					
Body weight	70 kg						
Risk management measures for ind							
ma mensares in ma	ustriar site						
Containment and local exhaust	Containment plus good work practice required	Yes					
ventilation	Local exhaust ventilation required plus good	No					
	work practise	INQ					
Personal protective equipment	Skin protection	Protective gloves					
(PPE)	Eye protection						
(1111)		Safety glasses					
	Clothing	Working clothing worn.					
	Respiratory protection	If handling solid salts, Filter mask P2 (FFP2) must be used					
	Breathing apparatus	None					
Other risk management measures	Procedural and control technologies	If handling solid salts,					
related to workers		containment and ventilation must be available.					
	Training, Monitoring/reporting and auditing systems	Equipment must be well maintained and cleaned daily.					
	Precautions against irritation	As necessary					
Waste related measures	Any solid wastes are ultimately assumed to 1						
(100 mg) (100 mg) (100 mg) (100 mg) (100 mg)	incineration.	and the second of the second of					
Human factors not influenced by	Not available						
risk management	rot available						
2.2 Control of environmental exposu	ure (FRC 8e)						
Product characteristics	in a (Line Oc)						
Physical form of product	Liquid (aqueous solution) or Solid salts (assume	ad to be in granular/flabs form					
Concentration of substance in	rather than powdered) No data	ed to be in granular/flake for it					
product	rvo data						
Amounts used	Amount per day: 80 tonnes/day wet weight approx. 400 kg Fe/day Annual amount used per site: Approx. 100 tonnes of iron salt, containing approximately 40 tonnes Fe						
Frequency and duration of use	Emission days per site: 100 d/y						
Operational conditions of use	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						
Fraction of applied amount lost from process/use to waste gas	0						
Fraction of applied amount lost from	0.8						
IA STATE OF THE ST	L 178WTO						

process/us	e to waste w	ater							
Risk man:	agement me	asures related	t()	environme	ntal emission	ns from industrial	sites		
Onsite pre-	treatment of	f waste water	N	ot applicabl	1.5				
Resulting	fraction of in	nitially applied		or approach					
amount in waste water released									
from site to the external sewage									
system	1110 011	icinai senase	N	ot applicabl	o.				
*	on abatemen	+		ot applicabl					
		pplied amount		or applicabl	C.				
		environment	X	at applicabl	2				
	ite treatment			ot applicabl					
		oplied amount	18	ot applicabl	i.C.				
		ste treatment.							
		et losses from							
		d the residues							
		ter and waste							
gas treatme		ter and waste	N	ot applicabl	2				
		ne of external		es	С.				
	r treatment	oc or external	- 1	es					
	(of the	waste water	21)00 m ³ /d					
	olant) discha		-21	D) III (U					
		or agriculture	100	es					
or horticul		or agriculture	1	Co					
	and the second second second	ier exposure							
		not expected fo	n th	ia a con ani a					
	Exposure e		1 111	is sectiatio.					
Section 3.		Sumation							
	al exposure		2/	A ADDACO	b, in absence	set EVA			
(in µg/cm ²			21	M (LECCO	o, in absence	OI LEV)			
	stemic expos	ura via	0	27 (PROC8	2)				
	h substance		U.	ZI(TRUCO	4)				
(in mg/kg l		as such							
	stemic expos	nira via	n	027 (PROC	201				
aqueous so		die vid	U.	027 (1 ROC	oa)				
(in mg/kg l									
Inhalation			N	anlinible fo	r contributio	a tacke that do not	involve handli	ng of solid produc	
manara	exposure		Negligible for contributing tasks that do not involve handling of solid products leading to evolution of dusts, or spraying of liquid products						
			See also below						
Inhalation	exposure					ainment and mech	mical/natural v	entilation; and PP	
	/8h workday	7	2.01 (PROC8a, 8b). Containment and mechanical/natural ventilation; and PPE (Filter mask P2 (FFP2)) must be used to limit exposure and manage risks.						
		ributing tasks	Equipment must be well maintained and cleaned daily.						
		olid products	-	quipinent in					
	evolution of								
Inhalation			n	a					
	/8h workday								
		ributing tasks							
		iquid product)							
Quantitati	ve risk chai	racterisation fo)1. /	vorkers					
	Route	exposure		Leading	DN(M)E	Risk	DN(M)EL	Risk	
		concentratio	11	toxic	L	characterisatio	(ECETOC	characterisatio	
		s (EC)		end	(ECHA)	n ratio)	n ratio	
				point /					
				Critical					
				effect					
Acute -	Dermal	mg/cm ²		Skin	Not		Not	-	
local				and/or	relevant		relevant		
effects				eye					
				irritation					
	Inhalatio	mg/m ³		no data	Not		Not	-	
	11				relevant		relevant		
					Lene your	1	151514111		

Acute -	Derma	1	mg/kg bw	d	Repeate			Not		
systemi					d dose	quantified		quantified		
c effects	Inhalat	10	mg/m³		Repeate			Not		
	n				d dose	quantified		quantified		
	Combi						RCR Inhalation-		RCR Inhalation	
	d route	28					systemic + RCR		systemie + RCF	
							Dermal-		Dermal-	
					1.82. 4		systemic		systemic	
Long-	Derma	1	mg/cm²/d		Skin	Not	4	Not		
term -					and/or	relevant		relevant		
local effects					eye irritatio	100				
effects	Inhalat	in	mg/m³		no data		-	Not		
	П	.10	1119/111		no data	relevant	175	relevant		
Long-	Derma	13			Repeate		0.21	6.5 - 10.0	0.04	
term -	Derma	1			d dose	mg/kg	V. 41	mg/kg	V.V+	
systemi					d dosc	bw/d		bw/d		
c effects	Inhalat	io			Repeate		0.43	23 - 36	0.09	
	n				d dose	mg/ m ³	100	mg/kg	1 See See Se	
					0.0000			bw/d		
	Combi	ne	1400		P. Letina		0.64.		0.13.	
	d route	S					Acceptable risk		Acceptable risk	
Section 3.2	Enviro	nme	nt					4		
Aquatic				L	imited by	water solubility	of ferric iron oxide	2		
Air				0						
Soil				- 80	0 kg/day					
Risk chara										
Aquatic cor	npartme	nt (ii	neluding sea	limen	t)		*			
Compartn	nents		PEC	P	NEC	PEC/PNEC	Discussion			
Surface wa	iter		2.4E-06 mg/l			(w)	-			
Freshwater	r sedime	nt	45.0 mg/k	g 4	9.5	0.909	The PEC associated with production is less than			
			dw	117	ig/kg dw		the indicative PNEC, resulting in a PEC/PNEC ratio of 0.909. Conclusion: acceptable risk.			
Risk charac	eterisatio	n for	the terrestr	ial co	mpartmei	1t				
Compartn		PE(PNF		PEC/PNEC	Discussion			
-		c1 -	7				The PEC associat	ed with produc	ction results in a	
Industrial s	soil	dw	mg/kg	55 n dw	ng/kg	0.94			usion: acceptable	
Atmospher	ic compa	irtine	ent				1.			
No basis fo				ot app	olicable					
Section 4:						ions				
Not availab										
Additional	good p	racti	ce advise b	eyono	l CSA					
Note: The r	neasures	s repo	orted in this	section	on have n		to account in the ex			
estimates re				enario	above. T	hey are not subj	ect to obligation lai	d down in		
Article 37 (

Section 1							
Exposure Scenario Title							
Title	Use as a laboratory chemical (industrial)						
Use Descriptor	SU 3, 24						
Process Categories and Environmental Release Categories	PROC 15						
Processes, tasks, activities covered	PROC15 Use as laboratory reagent						
Section 2							
Operational conditions and risk ma							
Section 2.1 Control of worker expos (PROC 15)	ure						
Product characteristics							
Physical form of product	Liquid (aqueous solution) or Solid salts (assume rather than powdered)	ed to be in granular/flake for					
Concentration of substance in product	No data						
Amounts used	no information						
Frequency and duration of use	Daily, up to 8 hours						
	ailable dilution capacity and characteristics of e	exposed humans					
Respiration volume under conditions of use	10 m ³ /d	Transfer in a second					
Area of skin contact with the substance under conditions of use	240 (PROC15)						
Body weight	70 kg						
Containment and local exhaust ventilation	Containment plus good work practice required Local exhaust ventilation required plus good	Yes No					
	work practise						
Personal protective equipment	Skin protection	Protective gloves					
(PPE)	Eye protection	Safety glasses					
	Clothing	Working clothing worn.					
	Respiratory protection	If handling solid salts, Fil mask P2 (FFP2) must used, in the absence of LE					
	Breathing apparatus	None					
Other risk management measures related to workers	Procedural and control technologies	If handling solid salts, LE OR containment as ventilation must be available.					
	Training. Monitoring/reporting and auditing systems	Equipment must be we maintained and clean daily.					
	Precautions against irritation	As necessary					
Waste related measures	Any wastes are ultimately assumed to be disposed chemical waste handlers.	d of via landfill or profession					
Human factors not influenced by risk management	Not available						
2.2 Control of environmental exposu	re						
	sure associated with use as a laboratory chemical	is considered to be negligib					
and is not considered further.							
and is not considered further. 2.3 Control of consumer exposure	this scenario.						
The possibility of environmental expo and is not considered further. 2.3 Control of consumer exposure Consumer exposure is not expected for Section 3: Exposure estimation	this scenario.						

Dermal local exposure (in µg/cm²)	10 (PROC15, with LEV)
Dermal systemic exposure via contact with substance as such (in mg/kg bw/d)	0.03 (PROC15)
Dermal systemic exposure via aqueous solution (in mg/kg bw/d)	0.003 (PROC15)
Inhalation exposure	Negligible for contributing tasks that do not involve handling of solid products leading to evolution of dusts, or spraying of liquid product See also below
Inhalation exposure (in mg/m³)/8h workday (refers only to any contributing tasks involving handling of solid products leading to evolution of dusts)	i) 1.8 (PROC8a, 8b).(LEV but no PPE) ii) 2.01 (PROC8a, 8b). Containment and mechanical/natural ventilation; and PPE (Filter mask P2 (FFP2)) must be used to limit exposure and manage risks. Equipment must be well maintained and cleaned daily.
Inhalation exposure (in mg/m³)/8h workday³ (refers only to any contributing tasks involving spraying of liquid product)	n/a

Quantitative risk characterisation for workers

	Route	exposure concentration s (EC)	Leading toxic end point / Critical effect	DN(M)E L (ECHA)	Risk characterisatio n ratio	DN(M)EL (ECETOC	Risk characterisatio n ratio
Acute - local effects	Dermal	mg/cm ²	Skin and/or eye irritation	Not relevant	-	Not relevant	-
	Inhalatio n	mg/m³	no data	Not relevant	-	Not relevant	2
Acute - systemi	Dermal	mg/kg bw/d	Repeate d dose	Not quantified		Not quantified	
e effects	Inhalatio n	mg/m³	Repeate d dose	Not quantified		Not quantified	
	Combine d routes				RCR Inhalation- systemic + RCR Dermal- systemic		RCR Inhalation systemic + RCF Dermal- systemic
Long- term – local effects	Dermal	mg/cm ² /d	Skin and/or eye irritation	Not relevant	<i>-</i>	Not relevant	
	Inhalatio n	mg/m³	no data	Not relevant		Not relevant	-
Long- term - systemi c effects	Dermal ^a		Repeate d dose	1.3 - 2.0 mg/kg bw/d	0.01	6.5 - 10.0 mg/kg bw/d	0.00
	Inhalatio n		Repeate d dose	4.6 - 7.2 mg/ m ³	0.43	23 - 36 mg/kg bw/d	0.09
	Combine d routes				0.44. Acceptable risk		0.09. Acceptable risk

Section 3.2 Environment

The possibility of environmental exposure associated with use as a laboratory chemical is considered to be negligible and is not considered further.

Section 4: Guidance to DU to check own conditions

Additional good practice advise beyond CSA

Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH

	ORY CHEMICAL (PROFESSIONAL)						
Section 1							
Exposure Scenario Title							
Title	Use as a laboratory chemical (professional)						
Use Descriptor	SU 3, 24						
Process Categories and Environmental Release	PROC 15						
Categories	DNOOTS II.						
Processes, tasks, activities covered	PROC15 Use as laboratory reagent						
Section 2							
Operational conditions and risk man							
Section 2.1 Control of worker expos (PROC 15)	ure						
Product characteristics							
Physical form of product	Liquid (aqueous solution) or Solid salts (assum- rather than powdered)	ed to be in granular/flake form					
Concentration of substance in product	No data						
Amounts used	no information						
Frequency and duration of use	Daily, up to 8 hours						
	ailable dilution capacity and characteristics of e	exposed humans					
Respiration volume under conditions of use	10 m ³ /d						
Area of skin contact with the substance under conditions of use	240 (PROC15)						
Body weight	70 kg						
Risk management measures for indi							
Containment and local exhaust	Containment plus good work practice required	Yes					
ventilation	Local exhaust ventilation required plus good work practise	No					
Personal protective equipment	Skin protection	Protective gloves					
(PPE)	Eye protection	Safety glasses					
	Clothing	Working clothing worn.					
	Respiratory protection	If handling solid salts, Filter mask P2 (FFP2) must be used, in the absence of LEV					
	Breathing apparatus	None					
Other risk management measures related to workers	Procedural and control technologies	If handling solid salts, LEV OR containment and ventilation must be available.					
	Training. Monitoring/reporting and auditing systems	Equipment must be well maintained and cleaned daily.					
	Precautions against irritation	As necessary					
Waste related measures	Any wastes are ultimately assumed to be dispose chemical waste handlers.	d of via landfill or professional					
Human factors not influenced by risk management	Not available						
2.2 Control of environmental exposu	re						
	sure associated with use as a laboratory chemical	is considered to be negligible					
2.3 Control of consumer exposure							
Consumer exposure is not expected for	this scenario.						
Section 3: Exposure estimation							
Section 3.1 Health							
Dermal local exposure (in μg/cm²)	20 (PROC15, in absence of LEV)						
Dermal systemic exposure via	0.01 (PROC15)						
7							

contact with substance as such (in mg/kg bw/d)	
Dermal systemic exposure via aqueous solution (in mg/kg bw/d)	0.001 (PROC15)
Inhalation exposure	Negligible for contributing tasks that do not involve handling of solid products leading to evolution of dusts, or spraying of liquid product See also below
Inhalation exposure (in mg/m³)/8h workday (refers only to any contributing tasks involving handling of solid products leading to evolution of dusts)	i) 1.8 (PROC8a, 8b). (LEV but no PPE) ii) 2.01 (PROC8a, 8b). Containment and mechanical/natural ventilation; and PPE (Filter mask P2 (FFP2)) must be used to limit exposure and manage risks. Equipment must be well maintained and cleaned daily.
Inhalation exposure (in mg/m³)/8h workday (refers only to any contributing tasks involving spraying of liquid product)	n/a

Quantitative risk characterisation for workers

	Route	exposure concentration s (EC)	Leading toxic end point /	DN(M)E L (ECHA)	Risk characterisatio n ratio	DN(M)EL (ECETOC)	Risk characterisatio n ratio
Acute - local effects	Dermal	mg/cm ²	Critical, effect Skin and/or eye irritation	Not relevant		Not relevant	-
	Inhalatio n	mg/m³	no data	Not relevant		Not relevant	-
Acute - systemi	Dermal	mg/kg bw/d	Repeate d dose	Not quantified		Not quantified	
c effects	Inhalatio n	mg/m³	Repeate d dose	Not quantified		Not quantified	
	Combine d routes				RCR Inhalation- systemic + RCR Dermal- systemic		RCR Inhalation systemic + RCF Dermal- systemic
Long- term – local effects	Dermal	mg/cm²/d	Skin and/or eye irritation	Not relevant	-	Not relevant	
	Inhalatio n	mg/m³	no data	Not relevant	-	Not relevant	<u></u>
Long- term - systemi c effects	Dermal ^a		Repeate d dose	1.3 - 2.0 mg/kg bw/d	0.01	6.5 - 10.0 mg/kg bw/d	0.00
	Inhalatio n		Repeate d dose	4.6 - 7.2 mg/ m ³	0.43	23 - 36 mg/kg bw/d	0.09
	Combine d routes				0.44. Acceptable risk		0.09. Acceptable risk

Section 3.2 Environment

The possibility of environmental exposure associated with use as a laboratory chemical is considered to be negligible and is not considered further.

Section 4: Guidance to DU to check own conditions

Additional good practice advise beyond CSA

Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH

ES 13. USE IN AGROCHEM	ICALS (PROFESSIONAL AND CONS	UMER)						
Section 1 Exposure Scenario Title								
Title	Use in Agrochemicals (professional and consume	er)						
Use Descriptor	SU 1, 21, 22							
Process Categories and Environmental Release Categories	PROC1, PROC2, PROC8a, PROC8b, PROC11, PROC13 ERC8A, ERC 8D							
Processes, tasks, activities covered	PROC1 Use in closed process, no likelihood of expression of the PROC2 Use in closed, continuous process with of PROC8a Transfer of substance or preparation vessels/large containers at non dedicated facilities PROC8b Transfer of substance or preparation vessels/large containers at dedicated facilities PROC11 Non industrial spraying PROC13 Treatment of articles by dipping and potential ERC8a Wide dispersive indoor use of processing ERC8d Wide dispersive outdoor use of processing	ecasional controlled exposure (charging/discharging) from/to (charging/discharging) from/to uring aids in open systems						
Section 2	Excod wide dispersive outdoor use of processin	g aids in open systems						
Operational conditions and risk ma	nagement measures							
Section 2.1 Control of worker expos (PROC1, PROC2, PROC8a, PROC8b	ure							
Product characteristics								
Physical form of product	Liquid (aqueous solution) or Solid salts (assumed to be in granular/flake form rather than powdered)							
Concentration of substance in product	No data							
Amounts used	Used amount of substance per day: Approx. 330 kg Fe/d in local area Annual amount used per site: 80 t agrochemcial products in the local area /y, assumed to contain not more than 40 tonnes Fe							
Frequency and duration of use	Daily, up to 8 hours							
	ailable dilution capacity and characteristics of e	vnosed humans						
Respiration volume under conditions of use	10 m ³ /d	sposed numans						
Area of skin contact with the substance under conditions of use	240 cm ² (PROC2, PROC8B, cm ²) 960 cm ² (PROC11)	PROC9, (PROC13) (PROC8A)						
Body weight	70 kg							
Risk management measures for indu	istrial site	12						
Containment and local exhaust ventilation	Containment plus good work practice required Local exhaust ventilation required plus good work practise	Yes No						
Personal protective equipment (PPE)	Skin protection Eye protection	Protective gloves Safety glasses						
	Clothing Respiratory protection	Working clothing worn. If handling solid salts, Filter mask P2 (FFP2) must be used If spraying outdoors, Half/full face powered air respirator with TMP2 or 3						
	D. J.	gas cartridge must be used.						
Other risk management measures related to workers	Breathing apparatus Procedural and control technologies	None If handling solid salts, containment and ventilation						

		must be available.
		If performing spraying indoors, a spraying booth with containment and LEV must be used. The exposure duration should be limited to 4 h/d.
		If spraying outdoors,
		If spraying outdoors, containment must be used. The exposure duration should be limited to 4 h/d; 3 d/w.
	Training. Monitoring/reporting and auditin systems	g Equipment must be well maintained and cleaned daily.
	Precautions against irritation	As necessary
Waste related measures	A limited release to drain is assumed which equipment washing. Spent packaging may be disposed of to landfill.	
Human factors not influenced by risk management	Not available	
2.2 Control of environmental exposu	re (ERC8A, ERC 8D)	
granular solid formulations requiring circumstances where the local iron lev	ertiliser is envisaged as passing to soil only. Su no cleaning of equipment. Iron-based fertiliser rels are deficient and detrimental to plant growth, con levels back to at or approaching normal back	's are only likely to be used in In terms of this assessment, the
for further evaluation for the environment		rground levels. There is no need
	ent.	
2.3 Control of consumer exposure Product characteristics		
Physical form of product	Timula (amount and time) and Callid alter (amount	1 . 1 . 1
	Liquid (aqueous solution) or Solid salts (assun rather than powdered)	ned to be in granular/Hake form
Concentration of substance in product	No data	
Amounts used	Usage is likely to be characterised as small scale Usage (based on exposure via a single WWTP, usage in a small town)	
Frequency and duration of use	Daily	
Risk management measures related	to consumers' use	
Personal protective equipment (PPE) required under regular conditions of consumer use	Type of PPE (gloves, etc): a) None - Worst case b) Gloves - More probable scenario	
Instructions addressed to consumers	As necessary, consumers should be advised to and/or to Use suitable protection	o avoid contact with skin/eyes
Risk management measures related to emissions to the environment	Municipal or other type of waste water treatment Effluent (of the waste water treatment plant)	Yes 2,000 m ³ /d
	discharge rate	Sea WALVERS TON
Section 3: Exposure estimation	mosimingo mis	
Section 3.1 Health		
Worker use		
Dermal local exposure (in µg/cm²)	200 (PROC8b, in absence of LEV)	
Dermal systemic exposure via contact with substance as such (in mg/kg bw/d)	0.27 (PROC8a)	
Dermal systemic exposure via aqueous solution (in mg/kg bw/d)	0.027 (PROC8a)	

Inhalatio	n exposur	9	Negligible for contributing tasks that do not involve handling of solid product leading to evolution of dusts, or spraying of liquid produces also below							
(refers contribut handling	only only ing tasks of soli	exposure kday to any s involving d products n of dusts)	PPE (Filter r	nask P2 (FFI	Containment and r (2)) must be used to naintained and clear	o limit exposui	ural ventilation; and re and manage risks			
(refers contribut spraying	only ing tasks of liquid p	to any involving	(Half/full facused to limit	ee powered a exposure an	ir respirator with T d manage risks. Ed	FMP2 or 3 gar quipment must	entilation: and PPE s cartridge) must be be well maintained 4 h/d and 3 d/w per			
Consumer			1000							
	cal exposure		1000							
(in µg/cm ²	stemie expos	TUPA:	a) 1.47	in absence o	Calaria					
(in mg/kg		KII C	a) 1.4 (b) 0.28		(gloves)					
Inhalation				(in absence	of aloves)					
			b) 0.02		8.0.1.007)					
Inhalation (in mg/m³)			Negligible for contributing tasks that do not involve handling of solid products leading to evolution of dusts, or spraying of liquid product See also below							
involving l		ributing tasks olid products dusts)								
Inhalation			1.1 (bandling	indoore) A	Acchanical/natural	ventilation 11	should be available			
(in mg/m ³)							siloulu de avalladie.			
, , ,	·		Assumes Exposure duration up to 2 h/d and I d/w Use of a dust mask would be advisable especially if suitable ventilation is not							
(refers only	y to any cont	ributing tasks	available or for longer durations of activity (refined exposure level 0.59 mg/m ³)							
involving s	spraying of 1	iquid product)			Assumes Exposure					
Quantitati	ive risk char	racterisation for		0						
	Route	exposure	Leading	DN(M)E	Risk	DN(M)EL	Risk			
		concentration	toxic	L	characterisatio	(ECETOC	characterisatio			
		s (EC)	end point / Critical effect	(ECHA)	n ratio)	n ratio			
Acute - local effects	Dermal	mg/cm ²	Skin and/or eye irritation	Not relevant	-	Not relevant				
11	Inhalatio n	mg/m³	no data	Not relevant	-	Not relevant	-			
Acute - systemi	Dermal	mg/kg bw/d	Repeate d dose	Not quantified		Not quantified				
c effects	Inhalatio n	mg/m³	Repeate d dose	Not quantified		Not quantified	n cp v i			
	Combine d routes				RCR Inhalation- systemic + RCR Dermal- systemic		RCR Inhalation- systemic + RCR Dermal- systemic			
Long- term - local effects	Dermal	mg/cm ² /d	Skin and/or eye irritation	Not relevant	-	Not relevant	-			
	Inhalatio n	mg/m³	no data	Not relevant		Not relevant	-			

Long- term - systemi	Dermal*		Repeate d dose	1.3 - 2.0 mg/kg bw/d	0.21	6.5 - 10.0 mg/kg bw/d	0.04
e effects	Inhalatio n		Repeate d dose	4.6 - 7.2 mg/ m ³	0.48	23 - 36 mg/kg bw/d	0.10
	Combine d routes				0.69. Acceptable risk		0.14. Acceptable risk
Quantitati	ve risk chai	racterisation for o	consumers				
	Route	exposure concentration s (EC)	Leading toxic end point / Critical effect	DN(M)E L (ECHA)	Risk characterisatio n ratio	DN(M)EL (ECETOC	Risk characterisatio n ratio
Acute - local effects	Dermal	1.0 mg/cm ² *	Skin and/or eye irritation	Not relevant	Refer to qualitative risk characterisation below	Not relevant	Refer to qualitative risk characterisation below
	Inhalatio n	mg/m³	no data	Not relevant	20	Not relevant	=
Acute - systemi c elfects	Dermal		Repeate d dose	0.7 - 1.0 mg/kg bw/d		3.5 - 5.0 mg/kg bw/d	
	Inhalatio n		Repeate d dose	1.1 - 1.5 mg/ m ³		5.5 - 7.5 mg/ m ³	
	Combine d routes				<1. Acceptable risk		<0.2. Acceptable risk
Long- term - local effects	Dermal	mg/cm²/d	Skin and/or eye irritation	Not relevant	Refer to qualitative risk characterisation below	Not relevant	Refer to qualitative risk characterisation below
	Inhalatio n	mg/m ³ ***	no data	Not relevant	-	Not relevant	IV .
Long- term - systemi c effects	Dermal ^a	a) 1.4 mg/kg bw/d b) 0.28 mg/kg bw/.d (if	Repeate d dose	0.7 - 1.0 mg/kg bw/d	2. of concern if gloves are not worn. 0.4. Acceptable	3.5 - 5.0 mg/kg bw/d	0.4 if gloves are not worn 0.08 if gloves
		gloves are worn)			risk, if gloves are worn.		are worn
	Inhalatio n	i) 1.1 mg/ m ³ ii) 0.59 mg/ m ³ 0.84 mg/m ³	Repeate d dose	1.1 - 1.5 mg/ m ³	1. Of concern if handled indoors without dust mask 0.54 (with dust mask) 0.76 (outdoors without dust mask)	5.5 - 7.5 mg/m ³	0.2 (handled indoors without dust mask) 0.11 (with dust mask) 0.15 (ourdoors without dust mask)
	Combine d routes				0.94 if gloves and dust mask worn. Acceptable risk		0.6. Acceptable

Section 3.1 Environment

By definition, the predicted environmental concentration associated with this application would be approximately equal to natural levels. In the context of this chemical safety assessment and the assumptions associated with this application, the conclusion is that normal use is within the range of acceptable risk.

Section 4: Guidance to DU to check own conditions

Not available

Additional good practice advise beyond CSA

Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH

Exposure Scenario Title							
Title	Adhesives Sealants and Coatings (industrial)						
Use Descriptor	U 3						
Process Categories and	PROC5, 7, 8a, 8b, 9,10,12,13,14						
Environmental Release	ERC5						
Categories							
Processes, tasks, activities		sses for formulation of preparations an					
covered	articles						
	(multistage and/or significant contact) PROC7 Industrial spraying						
	PROC8a Transfer of substance or prep	varation (charming/discharging) from					
	vessels/large	aration (charging/discharging) from					
	containers at non dedicated facilities						
	PROC8b Transfer of substance or prep	paration (charging/discharging) from/					
	vessels/large	(
	containers at dedicated facilities						
	PROC9 Transfer of substance or preparation	n into small containers (dedicated filling					
	line,						
	including weighing)						
	PROC10 Roller application or brushing						
	PROC12 Use of blowing agents in manufactu						
	PROC13 Treatment of articles by dipping and						
	PROC14 Production of preparations or articles by tabletting, compression, extrusion, Palletisation						
	ERC5 Industrial use resulting in inclusion into or onto a matrix						
Section 2	Erres magniturative resulting in metasion in	O OF OINO II THUBELS					
Operational conditions and risk n	nanagement measures						
Section 2.1 Control of worker exp							
(PROC5, 7, 8a, 8b, 9,10,12,13,14)							
1 * * * * * * * * * * * * * * * * * * *							
Product characteristics	Liquid (aqueous solution) or Solid salts (ass	umed to be in granular/flake form rathe					
Product characteristics Physical form of product	Liquid (aqueous solution) or Solid salts (ass than powdered)	umed to be in granular/flake form rathe					
Product characteristics Physical form of product Concentration of substance in		umed to be in granular/flake form rathe					
Product characteristics Physical form of product Concentration of substance in product	than powdered) No data						
Product characteristics Physical form of product Concentration of substance in product	than powdered) No data Used amount of substance per day: 200 kg iro						
Product characteristics Physical form of product Concentration of substance in product Amounts used	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y						
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours	on salt (approx. 80 kg Fe)					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi	on salt (approx. 80 kg Fe)					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours	on salt (approx. 80 kg Fe)					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m ³ /d	on salt (approx. 80 kg Fe) cs of exposed humans					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm²	on salt (approx. 80 kg Fe) cs of exposed humans (PROC12					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² (PROC5, PROC8B,	on salt (approx. 80 kg Fe) cs of exposed humans (PROC12 PROC9, PROC13, PROC14					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² (PROC5, PROC8B, 960 cm²	on salt (approx. 80 kg Fe) cs of exposed humans (PROC12 PROC9, PROC13, PROC14					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the substance under conditions of use	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² (PROC5, PROC8B, 960 cm² 1500 cm² (PROC7)	on salt (approx. 80 kg Fe) cs of exposed humans (PROC12 PROC9, PROC13, PROC14					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² (PROC5, PROC8B, 960 cm² 1500 cm² (PROC7) 70 kg	on salt (approx. 80 kg Fe) cs of exposed humans (PROC12 PROC9, PROC13, PROC14					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² (PROC5, PROC8B, 960 cm² 1500 cm² (PROC7) 70 kg	on salt (approx. 80 kg Fe) cs of exposed humans (PROC12 PROC9, PROC13, PROC14					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for in	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² 480 cm² (PROC5, PROC8B, 960 cm² 1500 cm² (PROC7) 70 kg ndustrial site	on salt (approx. 80 kg Fe) cs of exposed humans PROC9. PROC13, PROC14 (PROC8A, PROC16)					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² (PROC5, PROC8B, 960 cm² 1500 cm² (PROC7) 70 kg adustrial site Containment plus good work practice	on salt (approx. 80 kg Fe) cs of exposed humans (PROC12 PROC9, PROC13, PROC14					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for in Containment and local exhaust	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² (PROC5, PROC8B, 960 cm² 1500 cm² (PROC7) 70 kg industrial site Containment plus good work practice required	on salt (approx. 80 kg Fe) cs of exposed humans PROC9. PROC13, PROC14 (PROC8A, PROC10					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for in	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² 480 cm² (PROC5, PROC8B, 960 cm² 1500 cm² (PROC7) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus	on salt (approx. 80 kg Fe) cs of exposed humans PROC9. PROC13, PROC14 (PROC8A, PROC10					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for in Containment and local exhaust ventilation	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² 480 cm² (PROC5, PROC8B, 960 cm² 1500 cm² (PROC7) 70 kg industrial site Containment plus good work practice required Local exhaust ventilation required plus good work practise	on salt (approx. 80 kg Fe) cs of exposed humans PROC9. PROC13, PROC14 (PROC8A, PROC10					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for in Containment and local exhaust ventilation Personal protective equipment	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² (PROC5, PROC8B, 960 cm² 1500 cm² (PROC7) 70 kg industrial site Containment plus good work practice required Local exhaust ventilation required plus good work practise Skin protection	on salt (approx. 80 kg Fe) cs of exposed humans PROC9, PROC13, PROC14 (PROC8A, PROC10 Yes No Protective gloves Safety glasses					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for in Containment and local exhaust ventilation Personal protective equipment	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² (PROC5, PROC8B, 960 cm² 1500 cm² (PROC7) 70 kg industrial site Containment plus good work practice required Local exhaust ventilation required plus good work practise Skin protection Eye protection	on salt (approx. 80 kg Fe) cs of exposed humans PROC9, PROC13, PROC14 (PROC8A, PROC10 Yes No Protective gloves Safety glasses					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for in Containment and local exhaust	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² 480 cm² (PROC5, PROC8B, 960 cm² 1500 cm² (PROC7) 70 kg industrial site Containment plus good work practice required Local exhaust ventilation required plus good work practice Skin protection Eye protection Clothing	on salt (approx. 80 kg Fe) cs of exposed humans PROC9, PROC13, PROC16 (PROC8A, PROC16) Yes No Protective gloves					
Product characteristics Physical form of product Concentration of substance in product Amounts used Frequency and duration of use Operational conditions related to Respiration volume under conditions of use Area of skin contact with the substance under conditions of use Body weight Risk management measures for in Containment and local exhaust ventilation Personal protective equipment	than powdered) No data Used amount of substance per day: 200 kg iro Annual amount used per site: 24 T Fe/y Daily, up to 8 hours available dilution capacity and characteristi 10 m³/d 240 cm² (PROC5, PROC8B, 960 cm² 1500 cm² (PROC7) 70 kg industrial site Containment plus good work practice required Local exhaust ventilation required plus good work practise Skin protection Eye protection	on salt (approx. 80 kg Fe) cs of exposed humans (PROC12 PROC9, PROC13, PROC14 (PROC8A, PROC16 Yes No Protective gloves Safety glasses Working clothing worn.					

	Prouthing over	warding	If spraying outdoors, Half/full face powered air respirator with TMP2 or 3 gas cartridge must be used.		
VALUE OF THE PARTY	Breathing app		None		
Other risk management measures related to workers	Procedural an	d control technologies	If handling solid salts, LEV OR containment and ventilation must be available.		
			If performing spraying indoors, a spraying booth with containment and LEV must be used. The exposure duration should be limited to 4 h/d.		
			If spraying outdoors, containment must be used. The exposure duration should be limited to 4 h/d; 3 d/w.		
	systems	nitoring/reporting and auditing	Equipment must be well maintained and cleaned daily.		
		gainst irritation	As necessary		
Waste related measures	Any solid was	stes are ultimately assumed to be	disposed of via landfill or incineration.		
Human factors not influenced by risk management	Not available				
2.2 Control of environmental expo	osure (ERC8A,	ERC 8D)			
Product characteristics					
Physical form of product		queous solution) or Solid salts powdered)	(assumed to be in granular/flake form		
Concentration of substance in	No data				
product			(*)		
Amounts used		unt of substance per day: 200 kg nount used per site: 24 T Fe/y	riron salt (approx. 80 kg Fe)		
Frequency and duration of use	300 d/y				
Operational conditions of use					
Fraction of applied amount lost waste gas	from process/u	se to 0			
Fraction of applied amount lost waste water	from process/u	se to 0.002			
Risk management measures relate	ed to environm	ental emissions from industria	1 sites		
Onsite pre-treatment of waste water		Not applicable.			
Resulting fraction of initially applicable waste water released from site to	ed amount in the external				
sewage system		Not applicable.			
Air emission abatement		Not applicable.	*		
Resulting fraction of applied amoun	it in waste gas				
released to environment		Not applicable.			
Onsite waste treatment		Not applicable.			
Fraction of initially applied am	ount sent to				
external waste treatment. This is the					
losses from processes to waste, and		ATT TO PROPERTY.			
from onsite waste water and waste g		Not applicable.			
Municipal or other type of externa treatment		Yes			
Effluent (of the waste water tre discharge rate		2000 m ³ /d			
Recovery of sludge for agriculture of	r horticulture	Yes			
2.3 Control of consumer exposure	The second secon				
Consumer exposure is not relevant for	or this scenario.				
Section 3: Exposure estimation					
Section 3.1 Health					
Dermal local exposure (in μg/cm²)	400 (PROC5,	in absence of LEV)			

Dermal systemic exposure via contact with substance as such (in mg/kg bw/d)	0.3 (PROC5, PROC8a)
Dermal systemic exposure via aqueous solution (in mg/kg bw/d)	0.09 (PROC7)
Inhalation exposure	Negligible for contributing tasks that do not involve handling of solid products leading to evolution of dusts, or spraying of liquid product See also below
Inhalation exposure (in mg/m³)/8h workday (refers only to any contributing tasks involving handling of solid products leading to evolution of dusts)	i) 1.8 (PROC8a, 8b).(LEV but no PPE) ii) 2.0 – 2.2 (PROC8a, 8b). Containment and mechanical/natural ventilation; and PPE (Filter mask P2 (FFP2)) must be used to limit exposure and manage risks. Equipment must be well maintained and cleaned daily.
Inhalation exposure (in mg/m³)/8h workday (refers only to any contributing tasks involving spraying of liquid product)	3.3 (PROC11, spraying indoors). Spraying booth with containment and LEV must be used to limit exposure and manage risks. Equipment must be well maintained and cleaned daily. Exposure duration must be limited to 4 h/d per worker 3.3 (PROC11, spraying outdoors). Containment and ventilation; and PPE (Half/full face powered air respirator with TMP2 or 3 gas cartridge) must be used to limit exposure and manage risks. Equipment must be well maintained and cleaned daily. Exposure duration must be limited to 4 h/d and 3 d/w per worker

Quantitative risk characterisation for workers

	Route	exposure	Leading	DN(M)EL	Risk	DN(M)EL	Risk
		concentrations (EC)	toxic end point / Critical effect	(ECHA)	characterisation ratio	(ECETOC)	characterisation ratio
Acute - Dermal local effects	Dermal	mg/cm ²	Skin and/or eye irritation	Not relevant	-	Not relevant	
	Inhalation	mg/m³	no data	Not relevant	-	Not relevant	-
Acute - systemic	Dermal	mg/kg bw/d	Repeated dose	Not quantified		Not quantified	
effects	Inhalation	mg/m³	Repeated dose	Not quantified		Not quantified	
	Combined routes				RCR Inhalation- systemic + RCR Dermal- systemic	Y	RCR Inhalation systemic + RCI Dermal- systemic
Long- 1 term - local effects	Dermal	mg/cm ² /d	Skin and/or eye irritation	Not relevant	E-	Not relevant	#1
	Inhalation	mg/m³	no data	Not relevant	-	Not relevant	=
Long- term - systemic	Dermal ^a		Repeated dose	1.3 - 2.0 mg/kg bw/d	0.21	6.5 - 10.0 mg/kg bw/d	0.04
effects	Inhalation		Repeated dose	4.6 - 7.2 mg/ m ³	0.72	23 - 36 mg/kg bw/d	0.14
	Combined routes Environment				0.93. Acceptable risk		0.19. Acceptable risk

 Section 3.1 Environment

 Aquatic (before STP)
 0.16

 Air (direct + STP)
 0

 Soil (direct releases only)
 0

Risk characterisation

Compartments	PEC	PNEC	PEC/PNEC	Discussion
Surface water	2.4E-06 mg/l			-
Freshwater sediment	45.0 mg/kg dw	49.5 mg/kg dw	0.909	The PEC associated with production is less than the indicative PNEC, resulting in a PEC/PNEC ratio of 0.909. Conclusion: acceptable risk.

Compartments	PEC	PNEC	PEC/PNEC	Discussion
Industrial soil	50.1 mg/kg dw	55 mg/kg dw	0.91	The PEC associated with production results in a PEC/PNEC ratio of 0.91. Conclusion: acceptable risk.

Atmospheric compartment

No basis for risk characterisation. Not applicable

Section 4: Guidance to DU to check own conditions

Not available

Additional good practice advise beyond CSA

Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in

Article 37 (4) of REACH

Exposure Scenario Title								
Title	Adhesives Sealants and Coatings (professional and consumer)							
Use Descriptor	SU 22,21							
Process Categories and	PROC 8a 8b 9 10 11 13 19							
Environmental Release	ERC8e, 8f							
Categories								
Processes, tasks, activities covered	PROC8a Transfer of substance or preparat	ion (charging discha	rging) from/					
	vessels/large							
	containers at non dedicated facilities							
	PROC8b Transfer of substance or preparat	ion (charging/discha	rging) from/					
	vessels/large							
	containers at dedicated facilities	or or or o	entral control of the entral o					
	PROC9 Transfer of substance or preparation in	to small containers (c	ledicated fillin					
	line,							
	including weighing)							
	PROC10 Roller application or brushing PROC11 Non industrial spraying							
	PROC13 Treatment of articles by dipping and po PROC19 Hand-mixing with intimate contact and							
	ERC8c Wide dispersive indoor use resulting in in		, matrix					
	ERC8f Wide dispersive outdoor use resulting in							
Section 2	Executivide dispersive baldoor ase resulting in	merasion into or onto	a manix					
Operational conditions and risk m	anagement measures							
Section 2.1 Control of worker expe								
(PROC 8a 8b 9 10 11 13 19)	73417							
Product characteristics								
Physical form of product	Liquid (aqueous solution) or Solid salts (assume	vd to be in aranular/fl	ake form rath					
i nystem main en product	Liquid (aqueous solution) or Solid salts (assumed to be in granular/flake form rather than powdered)							
Concentration of substance in	No data							
product	170 1444							
Amounts used	Used amount of substance per day: Approx 41 kg	g iron salt (approx. 17	kg Fe)					
	Annual amount used per site: 5.1 T Fe/y	2 (up p						
Frequency and duration of use	Daily, up to 8 hours							
	available dilution capacity and characteristics o	f exposed humans						
Respiration volume under	10 m ³ /d							
conditions of use								
Area of skin contact with the	480 cm ² (PROC8B,	PROC9,	PROC1:					
substance under conditions of use	960 cm ² (PI	ROC8A,	PROC10					
	1500 cm ⁻		1					
	1500 cm ⁻ 1980 cm ⁻ (PROC19)		(
Body weight			(11001					
	1980 cm ² (PROC19) 70 kg		()					
Risk management measures for in	1980 cm² (PROC19) 70 kg dustrial site		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
Body weight Risk management measures for in Containment and local exhaust	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required	Yes	(11001)					
Risk management measures for in Containment and local exhaust	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus good	Yes No	(noon					
Risk management measures for in Containment and local exhaust ventilation	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus good work practice	No	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
Risk management measures for in Containment and local exhaust ventilation Personal protective equipment	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus good work practice Skin protection	No Protective gloves	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
Risk management measures for in Containment and local exhaust ventilation Personal protective equipment	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus good work practice Skin protection Eye protection	No Protective gloves Safety glasses						
Risk management measures for in Containment and local exhaust ventilation Personal protective equipment	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus good work practice Skin protection Eye protection Clothing	No Protective gloves Safety glasses Working clothing w	orn.					
Risk management measures for in Containment and local exhaust ventilation Personal protective equipment	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus good work practice Skin protection Eye protection	Protective gloves Safety glasses Working clothing w If handling solid sal	orn. Its , Filter mas					
Risk management measures for in	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus good work practice Skin protection Eye protection Clothing	No Protective gloves Safety glasses Working clothing w	orn. Its , Filter mas					
Risk management measures for in Containment and local exhaust ventilation Personal protective equipment	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus good work practice Skin protection Eye protection Clothing	Protective gloves Safety glasses Working clothing w If handling solid sal P2 (FFP2) mu	orn. Its , Filter mas st be use					
Risk management measures for in Containment and local exhaust ventilation Personal protective equipment	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus good work practice Skin protection Eye protection Clothing	Protective gloves Safety glasses Working clothing w If handling solid sal P2 (FFP2) mu If spraying outdoors	orn. Its , Filter mas st be use s, Half/full fac					
Risk management measures for in Containment and local exhaust ventilation Personal protective equipment	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus good work practice Skin protection Eye protection Clothing	Protective gloves Safety glasses Working clothing w If handling solid sal P2 (FFP2) mu If spraying outdoors powered air respira	orn. Its , Filter mas st be use s, Half/full fac tor with TMI					
Risk management measures for in Containment and local exhaust ventilation Personal protective equipment	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus good work practice Skin protection Eye protection Clothing Respiratory protection	Protective gloves Safety glasses Working clothing w If handling solid sal P2 (FFP2) mu If spraying outdoors powered air respira or 3 gas cartridge m	orn. Its , Filter mas st be use s, Half/full fac tor with TMI					
Risk management measures for in Containment and local exhaust ventilation Personal protective equipment	1980 cm² (PROC19) 70 kg dustrial site Containment plus good work practice required Local exhaust ventilation required plus good work practice Skin protection Eye protection Clothing	Protective gloves Safety glasses Working clothing w If handling solid sal P2 (FFP2) mu If spraying outdoors powered air respira	orn, lts , Filter mas st be use s, Half/full fac tor with TMI ust be used.					

Waste related measures	systems Precaution	ons against in		If performing spraying indoors, a spraying booth with containment and LEV must be used. The exposure duration should be limited to 4 h/d. If spraying outdoors, containment must be used. The exposure duration should be limited to 4 h/d; 3 d/w. Equipment must be well maintained and cleaned daily. As necessary sposed of via landfill or incineration.		
**				operation of memoration.		
Human factors not influenced by risk management	Not avail	lable				
2.2 Control of environmental exp	osure (FR('8c 8f)				
Product characteristics	would (Little					
Physical form of product	Liquid (ac	nueous solut	ion) or Solid salts (assumed	d to be in granular/flake form rather		
	than powd	ered)	Verses			
Concentration of substance in product	No data					
Amounts used	Used amount of substance per day (professional): 41 kg iron salt (approx. 17 kg Used amount of substance per day (consumer): 12 kg iron salt (approx. 5 kg Fe					
Frequency and duration of use	365 d/y - 6	consumer professional	•			
Operational conditions of use						
Fraction of applied amount lost fra	om = 0					
process/use to waste gas						
Fraction of applied amount lost fro	om 0.02					
process/use to waste water						
Risk management measures related	red to envir	onmental er	nissions from industrial si	tes		
Onsite pre-treatment of waste water		Not applie	able			
Resulting fraction of initially appl		140t appire	attre.			
in waste water released from s	site to the					
external sewage system		Not applic	able.			
Air emission abatement		Not applic				
Resulting fraction of applied amou	nt in waste					
gas released to environment		Not applie				
Onsite waste treatment		Not applie	able.			
Fraction of initially applied amou	ant sent to					
external waste treatment. This is direct losses from processes to was	the sum of					
residues from onsite waste water	and waste					
gas treatment.	WIN WASIC	Not applicable.				
Municipal or other type of exte	rnal waste	Yes				
water treatment						
Effluent (of the waste water treatr	nent plant)	2000 m ³ /d				
discharge rate						
Recovery of sludge for agric horticulture		Yes				
2.3 Control of consumer exposure)					
Product characteristics						
Physical form of product			Liquid (aqueous solution granular/flake form rather) or Solid salts (assumed to be in than powdered)		
Concentration of substance in product			No data			
Amounts used			Usage is likely to be char DIY projects and domesti	racterised as small scale, short term		
			As a second seco			

			арргоз	mption by users in c. 900 t over a year.	a small town	is expected to tota		
Frequency and duration of			Daily	Daily				
Risk management measu								
Personal protective equiregular conditions of const	imer use) required u	None	of PPE (gloves, etc): - Worst case				
Instructions addressed to c	onsumers			cessary, consumers kin/eyes and/or to Us				
Risk management measur environment	res related to	emissions to	waste Efflue	ipal or other type water treatment nt (of the waste w ent plant) discharge	rater 2,000 m	'\d		
Section 3: Exposure estin	nation							
Section 3.1 Health								
Worker								
Dermal local ex (in μg/cm²)	oposure 20	0 (PROC8b, ii	n absence of I	.EV)				
Dermal systemic ex	mocura 0	7 (PROC8a)						
via contact with subst such (in mg/kg bw/d)		. (1 XOC 0X)						
	posure 0.0	3 (PROC8a)						
	olution	, , , , , , , , , , , , , , , , , , , ,						
	Oldtion							
(in mg/kg bw/d)	N1	1: :1.1 2	V 34 S4 S	T 31 3 T 3 T	f 3 172	0 111 1 .		
Inhalation exposure	lea		evolution (asks that do not in of dusts, or	spraying of			
Inhalation ex	posure 2.0	- 2.2 (PROC	8a, 8b). Cont	ainment and mecha	inical/natural \	ventilation; and PPI		
(in mg/m³)/8h workda (refers only to	v (Fi	lter mask P2 (ist be well mai		be used to limit expo leaned daily.	osure and man	age risks. Equipmen		
contributing tasks inv								
handling of solid p								
leading to evolution of								
		/DD OCT 1		X 61 . 1 .1	121	. ITPIT		
	1			es). Spraying booth v				
(in mg/m³)/8h workda	y use	used to limit exposure and manage risks. Equipment must be well maintained and cleaned daily. Exposure duration must be limited to 4 h/d per worker						
(refers only to				ors). Containment a				
contributing tasks inv	volving fac	e powered ai	r respirator v	vith TMP2 or 3 gas	s cartridge) m	ust be used to limi		
spraying of liquid proc				quipment must be v				
				ited to 4 h/d and 3 d				
Quantitative risk charact								
Route e	xposure	Leading	DN(M)EL	Risk	DN(M)EL	Risk		
c	oncentration		(ECHA)	characterisation	(ECETOC)	characterisation		
(EC)	end	**	ratio		ratio		
		point /						
		Critical						
Acrita Diseasel	was Para 2	effect	N.		Not	=		
Acute - Dermal n	ng/cm²	Skin	Not	=1	Not			

relevant

quantified Not

Not relevant

and/or

no data

Repeated

Repeated

eye irritation

local

effects

Acute -

systemic effects Inhalation

mg/kg bw/d

relevant

quantified Not

quantified

	Combined routes					RCR Inhalation- systemic + RCR Dermal- systemic		RCR Inhalation- systemic + RCR Dermal- systemic
Long- term - local effects	Dermal	mg/cm²/d	Skin and/or eye irritation	Not relevant	1	-	Not relevant	D D
	Inhalation	mg/m³	no data	Not relevant	t	ē.	Not relevant	18
Long- term - systemic	Dermal*		Repeated dose	1.3 - mg/kg bw/d		0.21	6.5 - 10.0 mg/kg bw/d	0.04
effects	Inhalation		Repeated dose	4.6 - mg/ m ³		0.48	23 - 36 mg/kg bw/d	0.10
	Combined routes					0.69. Acceptable risk		0.14. Acceptable risk
(in µg/cm ²)	al exposure temic exposu	T.A.			870	and a bould for all y		
(in mg/kg b	w/d)	re .				ig/kg bw/d (acute) 14 mg/kg bw/d (chr	onic)	
inhalation e	exposure			h sı	Veglig iandlii prayii	tible for contributing of solid product	ting tasks tha	at do not involve colution of dusts, of produc
inhalation e (in mg/m³)/	xposure day ¹²			11.	/a			
solid produc	cts leading to	buting tasks involve evolution of dusts	ving handlin)	ig of				
Inhalation e (in mg/m³)/	xposure day ¹³			11)	/a			
(refers only		buting tasks involv	ving sprayin	g of				

liquid product) Quantitative risk characterisation for consumers

	Route	exposure concentrations (EC)	Leading toxic end point / Critical effect	DN(M)EL (ECHA)	Risk characterisation ratio	DN(M)EL (ECETOC)	Risk characterisation ratio
Acute - Do local effects	Dermal	0.25 mg/cm ² *	Skin and/or eye irritation	Not relevant	Refer to qualitative risk characterisation below	Not relevant	Refer to qualitative risk characterisation below
	Inhalation	mg/m³	no data	Not relevant	-	Not relevant	*
Acute - systemic effects	Dermal	0.28 mg/kg bw/d	Repeated dose	0.7 - 1.0 mg/kg bw/d	0.4	3.5 - 5.0 mg/kg bw/d	0.08
	Inhalation	-	Repeated dose	1.1 - 1.5 mg/ m ³	<u></u>	5.5 - 7.5 mg/ m ³	
	Combined routes				0.4. Acceptable risk		0.08. Acceptable risk
Long- term - local effects	Dermal	mg/cm ² /d	Skin and/or eye irritation	Not relevant	Refer to qualitative risk characterisation below	Not relevant	Refer to qualitative risk characterisation below

	Inhalation	mg/m ¹ ***	no data	Not	-	Not	-
				relevant		relevant	
Long-	Dermal ^a	8E-04	Repeated	0.7 - 1.0	0.001	3.5 - 5.0	0.0002
term -			dose	mg/kg		mg kg bw d	
systemic				bw/d			
effects	Inhalation	=	Repeated	1.1 - 1.5		5.5 - 7.5	-
			dose	mg/ m³		mg/m³	
	Combined	46	Ag Bure	- 27	0.001.		2E-04.
	routes	at the first of			Acceptable risk		Acceptable risk

Aquatic (before WWTP)	0.1kg/d (consumer) 0.34 kg/d (professional)
Soil (direct only)	0
Air (direct + STP)	0

Risk characterisation

Aquatic compartment (including sediment)

	Compartments	PEC	PNEC	PEC/PNEC	Discussion
	Surface water	2.4E-06 mg/l		-	
	Freshwater sediment	45.0 mg/kg dw	49.5 mg/kg dw	0.909	The PEC associated with production is less than the indicative PNEC, resulting in a PEC/PNEC ratio of 0.909. Conclusion: acceptable risk.

Risk characterisation for the terrestrial compartment

Compartments	PEC	PNEC	PEC/PNEC	Discussion
Industrial soil	50.1 mg/kg dw	55 mg/kg dw	0.91	The PEC associated with production results in a PEC/PNEC ratio of 0.91. Conclusion: acceptable risk.

Atmospheric compartment

No basis for risk characterisation. Not applicable

Section 4: Guidance to DU to check own conditions

Not available

Additional good practice advise beyond CSA

Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH