

Page : 1 / 10

Revision : 21/6/2019

Revision nr : 11

FERRIC CHLORIDE 40%

Code : 12566

Supersedes : 3/3/2015

SECTION 1. Identification of the substance/mixture and of the company/undertaking					
1.1. Product identifier					
Chemical description	: Ferric chloride solution (40%).				
Type of product	: Mixture.				
Reach registration number	: 01-2119497998-05				
1.2. Relevant identified use	es of the substance or mixture and uses advised against				
Identified use(s)	: See table on the front page of the annex.				
 * Use(s) advised against 	 This product is not recommended for any industrial, professional or consumer use other than identified in table on the front page of the annex. Not for use in ornamental articles, in tricks and jokes and in games (in accordance with Annex XVII to Regulation (EC) No 1907/2006) (3. Liquid substances or mixtures, which are fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: (a) hazard classes 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F, (b) hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10, (c) hazard class 4.1, (d) hazard class 5.1). 				
1.3. Details of the supplier	3. Details of the supplier of the safety data sheet				
Company identification	: BRENNTAG N.V Nijverheidslaan 38 - BE-8540 DEERLIJK TEL: +32(0)56/77.69.44 - FAX: +32(0)56/77/57/11 E-MAIL: info@brenntag.be - Website: www.brenntag.be				
	BRENNTAG Nederland B.V Donker Duyvisweg 44 - NL-3316 BM DORDRECHT TEL: +31(0)78/65.44.944 - FAX: +31(0)78/65.44.919 E-MAIL: info@brenntag.nl - Website: www.brenntag.nl				
1.4. Emergency telephone	number				
Emergency phone number	: Belgium : Antipoison Center - Brussels TEL: +32(0)70/245.245				
	The Netherlands : National Poisoning Information Center - Bilthoven TEL: +31(0)30/274.88.88 (Only for the purpose of informing medical personnel in				

cases of acute intoxications)

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Corrosive to metals - Category 1 - Warning (Met. Corr. 1; H290) Acute toxicity, oral - Category 4 - Warning (Acute Tox. 4, oral; H302) Skin irritation - Category 2 - Warning (Skin Irrit. 2; H315) Serious eye damage - Category 1 - Danger (Eye Dam. 1; H318)

2.2. Label elements

Label in accordance with Regulation (EC) No 1272/2008

Dangerous ingredient(s)
Hazard pictogram(s)
Ferric chloride

Signal word

- : Danger
- Hazard statements
- : H290 May be corrosive to metals. H302 Harmful if swallowed. H315 Causes skin irritation. H318 Causes serious eye damage.



Page : 2 / 10

Revision : 21/6/2019

Revision nr : 11 Supersedes : 3/3/2015

FERRIC CHLORIDE 40%

Code : 12566

SECTION 2. Hazards identification (continued)		
 Precautionary statements 		
- Prevention	: P280 - Wear protective gloves/eye protection/face protection.	
- Response	: P301+P312 - IF SWALLOWED: Call a POISON CENTER/doctor/ if you feel unwell. P302+P352 - IF ON SKIN : Wash with plenty of soap and water. P305+ P351+P338+P310 - IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.	
- Disposal considerations	: P501 - Dispose of this material and its container to hazardous or special waste collection point.	
2.3. Other hazards		
Physical/chemical hazards	: When contact with metals corrosion may occur and generate extremely flammable hydrogen gas.	
	The substance decomposes by heating or burning in formation of toxic and corrosive vapours.	
Hazards for the health	: A health dangerous concentration in the air will not or very slowly be reached by evaporation of this substance at app. 20°C; by spraying much faster.	
Hazards for the environment	: Product causes a strong drop of the pH-value of water and soil. This product is no substance or contains no PBT or vPvB (in accordance with Annex XIII).	
Hazards for the safety	: No significant danger.	

SECTION 3. Composition/information on ingredients

3.2. Mixtures

Name component(s)		Weight %	CAS nr	EINECS nr	Index nr	Reach nr	CLASSIFICATION
Ferric chloride	:	39 -41 %	7705-08-0	231-729-4		01-2119497998-05	Acute Tox. 4 (oral); H302 Skin Irrit. 2; H315 Eye Dam. 1; H318
Hydrochloric acid%	:	1 -2 %	7647-01-0	231-595-7	017-002-01-X	01-2119484862-27	Met. Corr. 1; H290 Skin Corr. 1A; H314 STOT SE 3; H335

Note: SCL applicable (Hydrochloric acid ...%)

The full text of the (EU)H-statements is in section 16.

SECTION 4. First aid measures

General	: CALL A PHYSICIAN IN ALL CIRCUMSTANCES. Never give anything by mouth to an unconscious person.
First Aid Measures	
- Inhalation	 Remove victim into fresh air. Allow the affected person to rest in semi-sitting position. If not breathing, give artificial respiration. Consult a doctor.
- Skin Contact	: Remove contaminated clothing. Rinse skin immediately with mild soap and plenty of water. (shower if necessary). Consult doctor if irritation develops.



Page : 3 / 10

Revision : 21/6/2019

Revision nr : 11

FERRIC CHLORIDE 40%

Supersedes : 3/3/2015

SECTION 4. First aid measu	res (continued)	
- Eye Contact	 Rinse immediately thoroughly and long (at least 15 min.) with plenty of water. Remove contact lenses. Immediately call a POISON CENTER or doctor/physician. Keep rinsing or dripping the eye during transport. 	
- Ingestion	: DO NOT INDUCE VOMITING. Rinse mouth with water. Call a POISON CENTER or doctor/physician if you feel unwell.	
4.2. Most important symptoms	and effects, both acute and delayed	
See section 11.		
4.3. Indication of any immediate medical attention and special treatment needed		
For specialist advice doctors should	contact the NVIC or the Belgian Poison center.	
SECTION 5. Firefighting mea	asures	
5.1. Extinguishing media		
Extinguishing Media		
- Suitable - Insuitable	:Extinguishing powder,Foam,Carbon dioxide (CO2),Water spray. :Heavy water stream.	
5.2. Special hazards arising fro	m the substance or mixture	
Special Exposure Hazards	: Fire may liberate toxic and stinging vapours. (E.g. Chlorine , Hydrogen chloride).	
5.3. Advice for firefighters		
Special Protective Equipment for Firefighters	: Use self-contained breathing apparatus and wear protective clothes when in close proximity to fire.	
Special Procedures	: Apply water spray or fog to cool nearby equipment. Avoid fire-fighting water to ente environment.	
SECTION 6. Accidental relea	ase measures	
6.1. Personal precautions, prot	ective equipment and emergency procedures	
Personal Precautions	: Evacuate all personnel immediately and ventilate area. Avoid breathing vapour and contact with skin, eyes and clothing. Wear	

6.2.	Environmental precautions
E	

6.2 Motheda and motorial fo	a containment and cleaning up
	Notify authorities if product enters sewers or public waters.
	Prevent entry of product in public water, sewers or soil.
	Dike in the spilled product as much as possible with inert material.
Environmental Precautions	: Shut off leaks if without risks.

6.3. Methods and material for containment and cleaning up

Methods for Cleaning Up: Collect the spillage in closable, suitable disposal containers.
Clean up any spills as soon as possible, using an inert absorbent material.
Dilute spilled liquid immediately with plenty of water and neutralise with base.

recommended personal protective equipment. (See section 8)

6.4. Reference to other sections

For personal protection, see section 8.

For the removal of the waste product, see section 13.



Page : 4 / 10

Revision : 21/6/2019

Revision nr : 11 Supersedes : 3/3/2015

FERRIC CHLORIDE 40%

Code : 12566

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Handling	 STRONG HYGIENE ! AVOID FOG TRANSFORMATION ! Avoid breathing vapour and contact with skin, eyes and clothing. Wear recommended personal protective equipment. (See section 8) Avoid heating, splashing and formation of vapour when emptying, pouring, diluting or dissolving the product. When using, do not eat, drink or smoke. Emergency eye wash fountains and showers should be available in the immediate vicinity of any potential exposure. 				
7.2. Conditions for safe storage,	7.2. Conditions for safe storage, including any incompatibilities				
Storage	 Keep only in the original, safely locked container in a well ventilated, cool and dark place. All dangerous products should be placed on a drip tray or should be barreled. Keep away from : Bases , Light metals , Halogenated hydrocarbons . 				
Packaging Material	:Polyethylene,Polypropylene,PVC,Polyester,Glass.				
Insuitable Packaging Material	:Light metals (Aluminium , Copper , Iron , Tin , Nickel).				
7.3. Specific end use(s)					

For identified uses, see subsection 1.2 and/or exposure scenarios.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

	Occupational Exposure Limits	: For harmful components : Ferric chloride : Limit value (BE) : 1 mg Fe/m ³ (2014) Hydrochloric acid% : Limit value (BE) : 5 ppm (8 mg/m ³) (2014) Hydrochloric acid% : Short time value (BE) : 10 ppm (15 mg/m ³) (2014) Hydrochloric acid% : Limit value (TWA 8 h) (NL) : 5 ppm (8 mg/m ³) (2007) Hydrochloric acid% : Limit value (TWA 15 min) (NL) : 10 ppm (15 mg/m ³) (2007)
*	Biological limit values	 For harmful components : Hydrochloric acid% : Biological limit values : They will be included when available.
	DNELS	 For harmful components : Ferric chloride : Worker, acute - systemic effects, inhalation : 5,9 mg/m³ Ferric chloride : Worker, acute - systemic effects, dermal : 1,7 mg/kg bw/day Ferric chloride : Worker, long-term - systemic effects, inhalation : 5,9 mg/m³ Ferric chloride : Worker, long-term - systemic effects, dermal : 1,7 mg/kg bw/day Ferric chloride : Consumer, acute - systemic effects, inhalation : 0,5 mg/m³ Ferric chloride : Consumer, acute - systemic effects, dermal : 0,29 mg/kg bw/day Ferric chloride : Consumer, acute - systemic effects, oral : 0,29 mg/kg bw/day Ferric chloride : Consumer, acute - systemic effects, oral : 0,29 mg/kg bw/day Ferric chloride : Consumer, long-term - systemic effects, dermal : 0,29 mg/kg bw/day Ferric chloride : Consumer, long-term - systemic effects, oral : 0,29 mg/kg bw/day Ferric chloride : Consumer, long-term - systemic effects, oral : 0,29 mg/kg bw/day Ferric chloride : Consumer, long-term - systemic effects, oral : 0,29 mg/kg bw/day Ferric chloride : Consumer, long-term - systemic effects, oral : 0,29 mg/kg bw/day Hydrochloric acid% : Worker, acute - local effects, inhalation : 15 mg/m³ Hydrochloric acid% : Worker, long-term - local effects, inhalation : 8 mg/m³
	PNECs	 For harmful components : Ferric chloride : Fresh water sediment : 49500 mg/kg Ferric chloride : Marine water sediment : 8 mg/m³ Ferric chloride : Soil : 55000 mg/kg Ferric chloride : Sewage treatment plant : 1455 mg/l Hydrochloric acid% : Fresh water sediment : Not relevant. Hydrochloric acid% : Marine water : 0,036 mg/l Hydrochloric acid% : Marine water : 0,036 mg/l



Page : 5 / 10

Revision : 21/6/2019

Revision nr : 11 Supersedes : 3/3/2015

FERRIC CHLORIDE 40%

Code : 12566

SECTION 8. Exposure controls/personal protection (continued)

	 Hydrochloric acid% : Soil : 0,036 mg/l Hydrochloric acid% : Intermittent release : 0,045 mg/l Hydrochloric acid% : Sewage treatment plant : 0,036 mg/l
8.2. Exposure controls	
Engineering Measures	: Ventilation , Local exhaust .
Personal Protection Equipment	
- Respiratory protection	: CE-approved mask for acid gases and vapours (type E, yellow).
- Skin protection	: Corrosion-proof protective clothing.
- Hand protection	 Suitable material for safety gloves (EN 374): As the product is a mixture of several substances, the durability of the glove materials can't be calculated in advance and has to be tested before use. material : Nitril rubber thickness : 0,7 mm breakthrough time > 480' material :
- Eye/Face protection	: Closed safety glasses or face shield.
Environmental exposure controls	: See sections 6, 7, 12 and 13.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

	3.1. Information on basic physical	and chemical properties
	Physical State (20°C)	: Liquid .
	Form/Colour	: Dark brown .
	Odour	: Pungent odour .
	Odour threshold	: No data available.
*	pH value	: app. 1
	Melting/Freezing point	: -50 °C
	Boiling Point/Range (1013 hPa)	: 100 - 105 °C
	Flash point	: Not applicable.
	Evaporation rate	: No data available.
	Explosion limits in air	: Not applicable.
	Vapour pressure	: No data available.
*	Relative vapour density (air=1)	: No data available.
*	Relative density of saturated vapour/air mixture (air=1)	: No data available.
	Relative density	: 1,4
	Density (20°C)	:1,41 - 1,45 kg/l (40% sol.)
	Solubility in water	: Complete solubility
	Log P Octanol/Water (20°C)	: -4
	Auto-ignition temperature	: No data available.
	Minimum ignition energy	: Not applicable.
	Decomposition temperature	: 315 °C
	Viscosity (20°C)	:5 - 20 mPas(Dynamic)
	Explosive properties	: No chemical groups associated with explosive properties .
	Oxidizing properties	: No chemical groups associated with oxidizing properties .



Page : 6 / 10

Revision : 21/6/2019 Revision nr : 11

FERRIC CHLORIDE 40%

Code : 12566

Supersedes : 3/3/2015

SECTION 10. Stability and reactivity		
10.1. Reactivity		
Reactivity	: Reacts violently with lyes.	
10.2. Chemical stability		
Stability	: Stable at normal circumstances .	
10.3. Possibility of hazardous rea	actions	
Hazardous reactions	: Contact with metallic substances may release inflammable hydrogen gas. Creation of: Hydrochloric acid).	
10.4. Conditions to avoid		
Conditions to avoid	:High temperatures , Freezing .	
10.5. Incompatible materials		
Materials to avoid	:Bases , Light metals , Halogenated hydrocarbons , Metals .	
10.6. Hazardous decomposition products		
Hazardous Decomposition Products	: Chlorine , Hydrogen chloride , Hydrogen gas .	

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity	
- Inhalation	 Symptoms include: Sore throat, Cough. For harmful components: Ferric chloride: LC50 (Rat, inhalation, 4 h): No data available. Hydrochloric acid%: LC50 (Rat, inhalation, 30'): 8,3 mg/l (Dust and fog)
- Skin contact	 Symptoms include: Redness, Pain, Burns. For harmful components: Ferric chloride : LD50 (Rat, dermal) : >2000 mg/kg (OECD Guideline 402) Hydrochloric acid% : LD50 (Rabbit, dermal) : No data available.
- Ingestion	 Harmful if swallowed. Symptoms include: Abdominal pain , Nausea , Vomiting , Diarrhea , Unconsciousness . For harmful components : Ferric chloride : LD50 (Rat, oral) : 450-900 mg/kg Hydrochloric acid% : LD50 (Rat, oral) : No data available.
Skin corrosion/irritation	: Causes skin irritation.
Serious eye damage/irritation	: Causes serious eye damage.
Aspiration hazard	: Not considered hazardous.
Respiratory or skin sensitisation	: Not sensitive .
Carcinogenicity	: Not listed as carcinogenic .
Mutagenicity	: Not listed as mutagenic .
Reproductive toxicity	: Not listed for reproductive toxicity .
Specific target organ toxicity - single exposure	: To human : Listed not for organ toxicity . For animals : No effects known.
Specific target organ toxicity - repeated exposure	: To human : Listed not for organ toxicity . For animals : Product may affect liver, resulting in organ abnormalities.

SECTION 12. Ecological information

12.1. Toxicity



MATERIAL SAFETY DATA SHEET

Page : 7 / 10

Revision : 21/6/2019

Revision nr : 11 Supersedes : 3/3/2015

FERRIC CHLORIDE 40%

Code : 12566

ECTION 12. Ecological inforr	nation (continued)			
Ecotoxicity	 For harmful components : Ferric chloride : LC50 (Fish, 96 h) : 20,3-59 mg/l (Lepomis macrochirus) Ferric chloride : EC50 (Algae, 72 h) : 6,9 mg/l (Pseudokirchneriella subcapitata) Ferric chloride : EC50 (Daphnia magna, 48 h) : 9,6-27,9 mg/l Ferric chloride : NOEC (Algae, 72 h) : 2,4 mg/l (Pseudokirchneriella subcapitata) (OECD Guideline 201) Ferric chloride : NOEC (Daphnia magna, 21 d) : 0,74 mg/l Hydrochloric acid% : LC50 (Fish, 96 h) : 20,5 mg/l (pH 3,25-3,5) (Lepomis macrochirus) Hydrochloric acid% : EC50 (Algae, 72 h) : 0,73 mg/l (pH 4,7) (Chlorella vulgaris) (OECD Guideline 201) Hydrochloric acid% : EC50 (Daphnia magna, 48 h) : 0,45 mg/l (pH 4,9) (OECD Guideline 202) 			
12.2. Persistence and degradability	t <u>v</u>			
Persistence and degradability	 For harmful components : Ferric chloride : Persistence and degradability : Inorganic . Hydrochloric acid% : Persistence and degradability : Inorganic . 			
12.3. Bioaccumulative potential				
Bioaccumulation	 For harmful components : Ferric chloride : Bioaccumulation : Not applicable. Hydrochloric acid% : Bioaccumulation : Bioaccumulation not expected . 			
<u>12.4. Mobility in soil</u>				
Mobility	 For harmful components : Ferric chloride : Mobility : No data available. Hydrochloric acid% : Mobility : Adsorption to solid soil phase is not expected. 			
12.5. Results of PBT and vPvB as	<u>sessment</u>			
Evaluation	: For harmful components : • Ferric chloride : PBT/vPvB : No • Hydrochloric acid% : PBT/vPvB : No			
12.6. Other adverse effects				
Photochemical ozone creation potential	: No data available.			
Ozone depletion potential	: No data available.			
Endocrine disrupting potential	No data available.			

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Global warming potential

Waste from residues/Unused products	: The product has to be destroyed according to national or local legislation, by a company specialised in handling hazardous waste products.
European list of waste products	: XXXXXX - European waste product code. This code is assigned on the basis of the most current applications and can not be representative for pollutions which are arisen at the effective use of the product. The producer of the waste has to evaluate its process himself and has to grant the appropriate waste coding. See Decision 2001/118/EC.
Removal contaminated packaging	 Packing is to be used exclusively for the packing of this product. After use, empty and close the packing very carefully. In case of returned packing, the empty packing can be offered back to the supplier.

: No data available.



Page : 8 / 10

Revision : 21/6/2019 Revision nr : 11

FERRIC CHLORIDE 40%

Code : 12566

Supersedes : 3/3/2015

SECTION 14. Transport information

<u>14.1. UN number</u>	
UN Number	: 2582
14.2. UN proper shipping name	
ADR/RID Name	: UN 2582 Ferric chloride solution, 8, III, (E)
ADN Name	: UN 2582 Ferric chloride solution, 8, III
IMDG Name	: UN 2582 Ferric chloride solution, 8, III
IATA Name	: UN 2582 Ferric chloride solution, 8, III
<u>14.3. Transport hazard classe(s)</u>	
Class	: 8
14.4. Packing group	
Packaging Group	: 111
14.5. Environmental hazards	
Environmentally hazard	: No
Marine pollutant	: No
14.6. Special precautions for use	<u>r</u>
Danger number	: 80
Hazard Label(s)	: 8
EmS-N°	: F-A , S-B
14.7. Transport in bulk according	to Annex II of MARPOL and the IBC Code
Type ship	: No data available.
Pollution category	: No data available.

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

	NFPA n°	:	3-0-0
	Relevant EU Rule(s)	:	Directive 98/24/EC of the Council of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work Decision 2001/118/EC of the Commission of 16 January 2001 amending Decision 2000/532/EC as regards the list of wastes Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/ 2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (Reach)
	National regulations		
	- Germany	:	WGK : 1
*	- Netherlands	:	Water damaging : B Decontamination exertion : 3

15.2. Chemical Safety Assessment

A chemical safety assessment has been carried out for the components that make up this material.



Page : 9 / 10

Revision : 21/6/2019 Revision nr : 11

FERRIC CHLORIDE 40%

Supersedes : 3/3/2015

SECTION 16. Other information

BRENNTAG

* This safety data sheet has been drawn up in accordance with Regulation (EC) No 1907/2006 and the corresponding current changes.

This safety data sheet is exclusively made for industrial/professional use.

* Has changed compared to previous revision.

*	Changes	: General revision .
*	Sources of used key data	: The information contained herein is based on the present state of our knowledge (Producer(s)) See also on the webaddress: http://apps.echa.europa.eu/registered/registered-sub.aspx#search
	(EU)H-statement(s)	: H290 - May be corrosive to metals. H302 - Harmful if swallowed. H315 - Causes skin irritation. H318 - Causes serious eye damage.
*	Classification procedure	: Met. Corr. 1; H290 - Based on test data (producer of component) Acute Tox. 4, oral; H302 - Calculation method Skin Irrit. 2; H315 - Additivity method Eye Dam. 1; H318 - Additivity method
*	List of abbrevations and acronyms	 Acute Tox. 4, oral : Acute toxicity, oral - Category 4 ADN (Accord européen relatif au transport international des marchandises Dangereuses par voie de Navigation interieur) : European agreement concerning the international carriage of dangerous goods by inland waterways ADR (Accord européen relatif au transport international des marchandises Dangereuses par Route) : European agreement concerning the international carriage of dangerous goods by road CO : Carbon monoxide DNEL (Derived No Effect Level) : an estimated safe exposure level EC50 : median Effective Concentration EmS (Emergency Schedule) : the first code refers to the relevant fire schedule and the second code refers to the relevant spillage schedule Eye Dam. 1 : Serious eye damage - Category 1 IATA (International Air Transport Association) : provisions concerning the international carriage of dangerous goods by air IMDG (International Martitime Dangerous Goods code) LC50 : median Lethal Concentration LD50 : median Lethal Concentration LMC (Augutic Acute 1; H400 or Aquatic Chronic 1; H410) and is used to derive by the summation method the classification of a mixture in which the substance is present Met. Corr. 1 : Corrosive to metals - Category 1 NFPA (National Fire Protection Association) or fire diamant NOEC (No Observed Effect Concentration) NVIC : National Poisoning Information Center OECD : Organisation for Economic Cooperation and Development PBEC (Predicted No Effect Concentration) : concentration below which exposure to a substance is not expected to cause adverse effects PVC : Polyvinyl chloride RCP (Reciproke Calculation Procedure) REACH : Registration, Evaluation, Authorisation and restriction of Che



Page : 10 / 10

Revision : 21/6/2019

Revision nr : 11 Supersedes : 3/3/2015

FERRIC CHLORIDE 40%

Code : 12566

SECTION 16. Other information (continued)

WGK (Wassergefahrdungsklasse) : a German classification of substances that indicate the environmental hazard for surface water vPvB : very persistent and very bioaccumulative

This information is to our knowledge correct and complete on the date of issue of this safety data sheet. The information only concerns the product and does not give any guarantee for the quality and the completeness of the properties of the product, or in case of mixing or using in any other process. It remains the responsibility of the user to assure himself that the information is suitable and complete concerning the special use he makes of the product.

BRENNTAG denies all responsibility for loss or damage resulting from the use of these data.

End of document

Ferric chloride

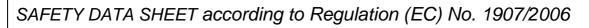
Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environm ental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance	3	NA	NA	1, 2, 3, 8b	1	NA	ES950
2	Formulation & (re)packing of substances and mixtures	3	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	2, 5	NA	ES952
3	Use in adhesives and sealants	21	NA	1	NA	8c, 8f	4, 7, 8, 11, 13	ES978
4	Use in agrochemicals	22	NA	NA	1, 2, 8a, 8b, 11, 13	8a, 8d	NA	ES970
5	Use in agrochemicals	21	NA	12, 27	NA	8a, 8d	NA	ES976
6	Use in laboratories	3	NA	NA	15	4	NA	ES1500
7	Use in laboratories	22	NA	NA	15	8a	NA	ES969
8	Use in process water treatment	3	NA	NA	2, 5, 8a, 8b	4	NA	ES954
9	Use in sewage water treatment	3	NA	NA	2, 5, 8a, 8b	5	NA	ES956
10	Use in process water treatment	22	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 15	8c, 8f	NA	ES7412
11	Use in gas treatment	3	NA	NA	2, 8a, 8b	2, 4, 6b	NA	ES958
12	Use as processing aid	3	NA	NA	2, 3, 4, 8b, 9, 15, 22, 26	4, 5, 6a, 6b	NA	ES960
13	Use in metal surface treatment.	3	NA	NA	5, 7, 8a, 8b, 13	2, 6b	NA	ES962
14	Use in metal surface treatment.	21	NA	14	NA	8a, 8d	NA	ES974
15	Use in adhesives and sealants	3	NA	NA	5, 7, 8a, 8b, 9, 10, 12, 13, 14	5	NA	ES966
16	Use in adhesives and sealants	22	NA	NA	8a, 8b, 9, 10, 11, 13, 19	8c, 8f	NA	ES972



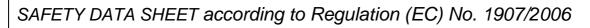
Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

BRENNTAG

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites					
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities					
Environmental Release Categories	ERC1: Manufacture of sul	bstances				
2.1 Contributing scenario co	ntrolling environmenta	I exposure for: ERC1				
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%				
Amount used	Annual amount per site	145000 ton(s)/year				
Amount used	Daily amount per site	483,333 tonnes				
Frequency and duration of use	Continuous exposure	300 days/year				
	Emission or Release Factor: Air	0 %				
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	0,0015 %				
on non an on pool o	Emission or Release Factor: Soil	0 %				
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and	Air	Given the highly controlled conditions used in the manufacture of the substance to prevent the release of gases, it can be assumed that the release in any form to air is effectively zero				
measures to reduce or limit	Water	Wastewater release into municipal STP.				
discharges, air emissions and releases to soil Organizational measures to	Soil	Soil emission controls are not applicable as there is no direct release to soil.				
prevent/limit release from the site						
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant				
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	10.000 m3/d				
	Sludge Treatment	Recovery of sludge for agriculture or horticulture				
Conditions and measures related to external treatment of waste for	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge				
disposal	Disposal methods	Can be landfilled or incinerated, when in compliance with local regulations.				



Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

BRENNTAG

Air emission controls are not applicable as there is no direct release to air.						
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3						
	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%				
Product characteristics	Physical Form (at time of use)	liquid				
	Vapour pressure	< 0,0001 hPa				
	Physical Form (at time of use)	solid				
Fraguency and duration of use	Frequency of use	300 days/year				
Frequency and duration of use	Covers daily exposures up	to 8 hours (unless stated differently).				
	Exposed skin areas	Palm of one hand (240cm2) (PROC1, PROC3)				
Human factors not influenced by	Exposed skin areas	Palms of both hands (480 cm2) (PROC2)				
risk management	Breathing volume	10 m3/day				
	Body weight	70 kg				
Other operational conditions	Indoor use.					
affecting workers exposure						
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures(PROC1, PROC2, PROC3)					
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection. Wear suitable protective clothing.(PROC1, PROC2, PROC3) Wear chemically resistant gloves. (Efficiency: 90 %)(PROC1, PROC2, PROC3)					
2.3 Contributing scenario co	ntrolling worker exposu	re for: PROC8b				
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%				
	Physical Form (at time of use)	solid				
	Frequency of use	300 days/year				
Frequency and duration of use	Covers daily exposures up	to 8 hours (unless stated differently).				
	Exposed skin areas	Palms of both hands (480 cm2) (PROC8b)				
Human factors not influenced by risk management	Breathing volume	10 m3/day				
nsk management	Body weight	70 kg				
Other operational conditions affecting workers exposure	Indoor use.					
Technical conditions and measures to control dispersion from source towards the worker Organisational measures to	Provide local exhaust ventilation (LEV). (Efficiency: 90 %) Provide basic employee training to prevent/minimize exposures					
prevent /limit releases, dispersion						
P1680_005	3/50		ΕN			

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

and exposure

Conditions and measures related	
to personal protection, hygiene	Wear suitable protective clothing.
and health evaluation	Wear chemically resistant gloves. (Efficiency: 90 %)

3. Exposure estimation and reference to its source

I

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC1		Water	PEC	< 0,0001mg/L	< 0,0001
ERC1		Soil	PEC	53g/kg	0,9636
ERC1		Fresh water sediment	PEC	45g/kg	0,9091

Workers

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

Contributing Scenario	Specific conditions	Exposure routes	Exposure routes Level of Exposure	
PROC1, PROC2, PROC3	worst-case	Worker - inhalative, long- term - systemic	1,8mg/m ³	0,39
PROC1, PROC2, PROC3	worst-case	Worker - dermal, long- term - systemic	0,14mg/kg bw/day	0,11
PROC8b	worst-case	Worker - inhalative, long- term - systemic	1,8mg/m ³	0,39
PROC8b	worst-case	Worker - dermal, long- term - systemic		

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.

For scaling see: http://www.ecetoc.org/tra

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Ensure that good work practices are implemented

P1680_005



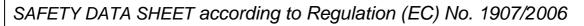
Ferric chloride

Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

1. Short title of Exposure Sc	enario 2: Formulation &	(re)packing of substances and mixtures		
Main User Groups	SU 3: Industrial uses: Use sites	s of substances as such or in preparations at industrial		
Process categories	 PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelettisation PROC15: Use as laboratory reagent 			
Environmental Release Categories	ERC2: Formulation of prep ERC5: Industrial use resul	parations ting in inclusion into or onto a matrix		
2.1 Contributing scenario co	ontrolling environmental	exposure for: ERC2, ERC5		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%		
Amount used	Annual amount per site	50 ton(s)/year		
Anount used	Daily amount per site	166,67 kg		
Frequency and duration of use	Continuous exposure	300 days/year		
Environment factors not influenced by risk management	Dilution Factor (River)	10		
	Emission or Release Factor: Air	0 %		
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	2 %		
entrionnal expectite	Emission or Release Factor: Soil	0 %		
Technical conditions and	Water	Wastewater release into municipal STP.		
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site				
P1680_005	5/50	EN		



BRENNTAG

Print Date 16.04.2013

Ferric chloride

Version 1.0

Revision Date 16.04.2013

Type of Sewage Municipal sewage treatment plant **Treatment Plant** Conditions and measures related Flow rate of sewage 2.000 m3/d treatment plant effluent to sewage treatment plant Disposal or recovery, Recovery of sludge for Sludge Treatment agriculture or horticulture Waste water treatment may vary at different sites. Wastewater should be at least treated in either an Waste treatment Conditions and measures related on-site or a municipal secondary biological to external treatment of waste for treatment plant prior to discharge disposal Can be landfilled or incinerated, when in Disposal methods compliance with local regulations. 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3 Concentration of the Covers concentrations of substance in product: Substance in 80%-100% Mixture/Article Physical Form (at time of Product characteristics liquid use) < 0,0001 hPa Vapour pressure Physical Form (at time of solid use) Frequency of use 300 days/year Frequency and duration of use Covers daily exposures up to 8 hours (unless stated differently). Palm of one hand (240cm2) (PROC1, PROC3) Exposed skin areas Palms of both hands (480 cm2) (PROC2) Exposed skin areas Human factors not influenced by risk management Breathing volume 10 m3/day Body weight 70 kg Indoor use. Other operational conditions affecting workers exposure Organisational measures to Provide basic employee training to prevent/minimize exposures(PROC1, prevent /limit releases, dispersion PROC2, PROC3) and exposure Conditions and measures related Use suitable eye protection. Wear suitable protective clothing.(PROC1, PROC2, PROC3) to personal protection, hygiene and health evaluation Wear chemically resistant gloves. (Efficiency: 90 %)(PROC1, PROC2, PROC3) 2.3 Contributing scenario controlling worker exposure for: PROC4, PROC5, PROC9, PROC14, PROC15 Concentration of the Covers concentrations of substance in product: Substance in 80%-100% Mixture/Article Product characteristics Physical Form (at time of liquid use) < 0.0001 hPa Vapour pressure P1680 005 6/50 ΕN

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

Amount used	Amount per Day	420 kg	
Frequency and duration of use	Frequency of use	300 days/year	
requency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).		
Human factors not influenced by	Exposed skin areas	Palms of both hands (480 cm2) (PROC4, PROC5, PROC9, PROC14)	
risk management	Exposed skin areas	Palm of one Hand 240 cm ² (PROC15)	
Other operational conditions	Indoor use.		
affecting workers exposure			
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee tra PROC5, PROC9, PROC14	nining to prevent/minimize exposures(PROC4, , PROC15)	
Conditions and measures related to personal protection, hygiene	PROC15)	othing.(PROC4, PROC5, PROC9, PROC14,	
and health evaluation	Wear chemically resistant (PROC14, PROC15)	gloves. (Efficiency: 90 %)(PROC4, PROC5, PROC9,	
2.4 Contributing scenario con	ntrolling worker exposu	re for: PROC8a, PROC8b	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
	Physical Form (at time of use)	solid	
Amount used	Amount per Day	166,67 kg	
Frequency and duration of use	Frequency of use	300 days/year	
requency and duration of use	Covers daily exposures up	to 8 hours (unless stated differently).	
	Exposed skin areas	Palms of both hands (480 cm2) (PROC8b)	
Human factors not influenced by	Exposed skin areas	Two hands 960 cm ² (PROC8a)	
risk management	Breathing volume	10 m3/day	
	Body weight	70 kg	
Other operational conditions	Indoor use.		
affecting workers exposure			
Technical conditions and measures to control dispersion from source towards the worker	Provide local exhaust venti	lation (LEV). (Efficiency: 90 %)(PROC8a, PROC8b)	
Organisational measures to prevent /limit releases, dispersion	Provide basic employee training to prevent/minimize exposures(PROC8a, PROC8b)		
and exposure Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Wear suitable protective clo Wear chemically resistant of	n. othing.(PROC8a, PROC8b) gloves. (Efficiency: 90 %)(PROC8a, PROC8b)	
3. Exposure estimation and		<u></u>	

P1680_005

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2, ERC5		Water	PEC	< 0,0001mg/L	< 0,0001
ERC2, ERC5		Soil	PEC	50,1g/kg	0,9109
ERC2, ERC5		Fresh water sediment	PEC	45g/kg	0,9091

Workers

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

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2, PROC3	worst-case	Worker - inhalative, long- term - systemic 1,8mg/m ³		0,39
PROC1, PROC2, PROC3	worst-case	Worker - dermal, long- term - systemic	0,7mg/kg bw/day	0,54
PROC4, PROC5, PROC9, PROC14, PROC15	worst-case	Worker - inhalative, long- term - systemic	1,8mg/m³	0,39
PROC4, PROC5, PROC9, PROC14, PROC15	worst-case	Worker - dermal, long- term - systemic	0,7mg/kg bw/day	0,54
PROC8a, PROC8b	worst-case	Worker - inhalative, long- term - systemic	1,8mg/m ³	0,39
PROC8a, PROC8b	worst-case	Worker - dermal, long- term - systemic	0,7mg/kg bw/day	0,54

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.

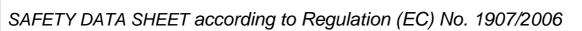
For scaling see: http://www.ecetoc.org/tra

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Ensure that good work practices are implemented

P1680_005



Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

BRENNTAG

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)		
Chemical product category	PC1: Adhesives, sealants		
Article categories	AC4: Stone, plaster, cement, glass and ceramic articles AC7: Metal articles AC8: Paper articles AC11: Wood articles AC13: Plastic articles		
Environmental Release Categories		door use resulting in inclusion into or onto a matrix tdoor use resulting in inclusion into or onto a matrix	
2.1 Contributing scenario co	ntrolling environmental	exposure for: ERC8c, ERC8f	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%	
Amount used	Annually total	900 tonnes	
Frequency and duration of use	Continuous exposure	365 days/year	
Environment factors not influenced by risk management	Dilution Factor (River)	10	
	Emission or Release Factor: Air	0 %	
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	0,02 %	
,	Emission or Release Factor: Soil	0 %	
2.2 Contributing scenario co	ntrolling consumer expo	osure for: PC1	
	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
Frequency and duration of use	Frequency of use	365 days/year	
Other given operational	Indoor use.		
conditions affecting consumers exposure			
Conditions and measures related	Consumer Measures	Avoid contact with skin.	
to protection of consumer (e.g. behavioural advice, personal protection and hygiene)		·	

P1680_005

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8c, ERC8f		Fresh water sediment	PEC	45g/kg	0,9091
ERC8c, ERC8f		Water	PEC	< 0,0001mg/L	< 0,0001

Consumers

ConsExpo 4.1

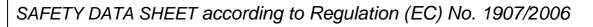
Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC1		Consumer - dermal, long- term - systemic	0,0008mg/kg bw/day	0,001

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.

For scaling see: http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES



Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

BRENNTAG

1. Short title of Exposure Sco	enario 4: Use in agroche	micals		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)			
Process categories	PROC1: Use in closed process, no likelihood of exposure 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 PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring			
Environmental Release Categories		door use of processing aids in open systems utdoor use of processing aids in open systems		
2.1 Contributing scenario co	ntrolling environmental	exposure for: ERC8a, ERC8d		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%		
Amount used	Annual amount per site	24 ton(s)/year		
Amount used	Daily amount per site	200 kg		
Frequency and duration of use	Continuous exposure	120 days/year		
Environment factors not influenced by risk management	Dilution Factor (River)	10		
	Number of emission days per year	120		
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %		
on nonnai expedite	Emission or Release Factor: Water	5 %		
Technical conditions and	Water	Wastewater release into municipal STP.		
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site				
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant		
	Flow rate of sewage	0.000 0./-1		

 Conditions and measures related to sewage treatment plant
 Flow rate of sewage treatment plant effluent
 2.000 m3/d

 Sludge Treatment
 Recovery of sludge for agriculture or horticulture

P1680_005

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

disposal	Disposal methods	compliance with local regulations.	
	ntrolling worker exposu	re for: PROC1, PROC2, PROC8a, PROC8b	
	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
	Physical Form (at time of use)	solid	
Frequency and duration of use	Frequency of use	120 days/year	
Frequency and duration of use	Covers daily exposures up	to 8 hours (unless stated differently).	
	Exposed skin areas	Palm of one hand (240cm2) (PROC1)	
	Exposed skin areas	Palms of both hands (480 cm2) (PROC2, PROC8b)	
Human factors not influenced by isk management	Exposed skin areas	Two hands 960 cm ² (PROC8a)	
nsk management	Breathing volume	10 m3/day	
	Body weight	70 kg	
Other operational conditions affecting workers exposure	Indoor use.		
	–		
Technical conditions and measures to control dispersion from source towards the worker	Ensure that a mechanical ventilation is in place(PROC2, PROC8a, PROC8b)		
Conditions and measures related	Wear chemically resistant gloves. (Efficiency: 90 %)(PROC1, PROC2, PROC8a, PROC8b)		
to personal protection, hygiene and health evaluation	Wear a respirator conforming to EN140 with Type A/P2 filter or better. (Efficiency: 90 %)(PROC2, PROC8a, PROC8b)		
		othing.(PROC1, PROC2, PROC8a, PROC8b)	
2.3 Contributing scenario co	ntrolling worker exposu	re for: PROC11, PROC13	
	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
	Frequency of use	120 days/year(PROC13)	
Frequency and duration of use	Covers daily exposures up	to 8 hours (unless stated differently).(PROC13)	
	Frequency of use	3 days/week(PROC11)	
Human factors not influenced by	Exposed skin areas	Hands and forearms. 1500 cm ² (PROC11)	
risk management	Exposed skin areas	Palms of both hands (480 cm2) (PROC13)	

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

	Breathing volume	10 m3/day	
	Body weight	70 kg	
Other operational conditions	Indoor use.		
affecting workers exposure			
Technical conditions and measures to control dispersion	Carry out in a vented booth or extracted enclosure. Provide local exhaust ventilation (LEV).		
from source towards the worker	Avoid carrying out operation for more than 4 hours.(Indoor PROC11) Ensure containment of the emission source(Outdoor PROC11)		
Organisational measures to	Clean equipment and the work area every day.(PROC11, PROC13)		
prevent /limit releases, dispersion and exposure			
	Wear chemically resistar	nt gloves. (Efficiency: 90 %)(PROC11, PROC13)	
	Use suitable eye protection.		
	Wear suitable protective clothing.(PROC11, PROC13)		
Conditions and measures related	If no LEV or vented laminar spray booth available.		
to personal protection, hygiene and health evaluation	Wear a full face respirator TM3 conforming to EN147 with type A filter or better (Efficiency: 95 %)(Indoor PROC11)		
	or Wear a full face respirator TM3 conforming to EN147 with type A filter or better (Efficiency: 95 %)(Outdoor PROC11)		
2 Expective extimation and	reference to ite cours		

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

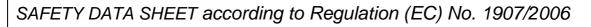
Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d		Soil	PEC	50g/kg	0,9091
ERC8a, ERC8d		Fresh water sediment	PEC	45g/kg	0,9091
ERC8a, ERC8d		Water	PEC	< 0,0001mg/L	< 0,0001

Workers

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

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2, PROC8a, PROC8b	worst-case	Worker - inhalative, long- term - systemic	2,2mg/m ³	0,48
PROC1, PROC2, PROC8a, PROC8b	worst-case	Worker - dermal, long- term - systemic	0,27mg/kg bw/day	0,21
PROC11, PROC13	worst-case	Worker - dermal, long- term - systemic	0,27mg/kg bw/day	0,21
P1680_005		13/50		EN

			BRENN	TAG
SAFETY D	ATA SHEET accord	ding to Regulation	(EC) No. 1907/	2006
Ferric chle	oride			
Version 1.0			Print I	Date 16.04.2013
Revision Date	e 16.04.2013			
PROC11	worst-case	Worker - inhalative, long- term - systemic	3,3mg/m³	0,48
4. Guidance Exposure	to Downstream User to o Scenario	evaluate whether he wor	ks inside the bound	aries set by the
default values For scaling se Only properly	ental emission has been eval have been used, unless othe e: http://www.ecetoc.org/tra trained persons shall make u ndaries set by the ES	erwise indicated.		
Additional good	d practice advice beyond th	ne REACH Chemical Safety	Assessment	
P1680_005		14/50		EN



Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

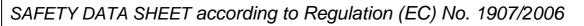
BRENNTAG

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)		
Chemical product category	PC12: Lawn and garden preparations, including fertilizers (- Fertilizers) PC27: Plant protection products		
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems		
2.1 Contributing scenario co	ntrolling environmental	exposure for: ERC8a, ERC8d	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 40 %	
Frequency and duration of use	Continuous exposure	365 days/year	
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %	
	Emission or Release Factor: Water	0,05 %	
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant	
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d	
2.2 Contributing scenario co	ntrolling consumer expe	osure for: PC12, PC27	
	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 40 $\%$	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
Frequency and duration of use	Frequency of use	365 days/year	
Other given operational conditions affecting consumers exposure	Indoor and outdoor use.		
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Wear suitable gloves.	

Environment

Used EUSES model.

P1680_005



Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d		Fresh water sediment	PEC	45g/kg	0,9091
ERC8a, ERC8d		Water	PEC	< 0,0001mg/L	< 0,0001

ConsExpo 4.1					
Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR	
PC12, PC27	worst-case	Consumer - dermal, long- term - systemic	0,28mg/kg bw/day	0,4	
PC12, PC27	worst-case	Consumer - inhalative, long-term - systemic	0,59mg/m³	0,54	

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.

For scaling see: http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES



Ferric chloride

Version 1.0

Print Date 16.04.2013

Revision Date 16.04.2013

1. Short title of Exposure Scenario 6: Use in laboratories

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC15: Use as laboratory reagent
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

2.1 Contributing scenario controlling environmental exposure for: ERC4

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

2.2 Contributing scenario co	ntrolling worker exposu	re for: PROC15	
	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
	Physical Form (at time of use)	solid	
Amount used	Worker contact is generally very low as most operations are remotely controlled and sampling/analysis events are of short duration.		
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).		
	Exposed skin areas	Palm of one hand (240cm2)	
Human factors not influenced by risk management	Breathing volume	10 m3/day	
nsk management	Body weight	70 kg	
Other operational conditions affecting workers exposure	Indoor use.		
Technical conditions and	Provide local exhaust ventilation (LEV).		
measures to control dispersion from source towards the worker			
Organisational measures to		ining to prevent/minimize exposures	
prevent /limit releases, dispersion and exposure	Clean equipment and the v	vork area every day.	
	Wear chemically resistant	gloves.	
Conditions and measures related	Wear chemical resistant protective eye glasses.		
to personal protection, hygiene and health evaluation	If no LEV:		
and health evaluation	Wear respiratory protectior Particle filter:P2		
2 Expedite estimation and			
3. Exposure estimation and	reference to its source		

P1680_005

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

Environment

No exposure assessment presented for the environment.

Workers

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

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC15	worst-case	Worker - dermal, long- term - systemic	0,03mg/kg bw/day	0,02
PROC15	worst-case	Consumer - inhalative, long-term - systemic	1,8mg/m³	0,39

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

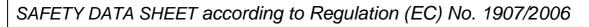
For scaling see: http://www.ecetoc.org/tra

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Ensure that good work practices are implemented

P1680_005



Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

1. Short title of Exposure Scenario 7: Use in laboratories

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC15: Use as laboratory reagent
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems

2.1 Contributing scenario controlling environmental exposure for: ERC8a

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

2.2 Contributing scenario co	ntrolling worker exposu	re for: PROC15		
	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%		
Product characteristics	Physical Form (at time of use)	liquid		
	Vapour pressure	< 0,0001 hPa		
	Physical Form (at time of use)	solid		
Amount used	Worker contact is generally very low as most operations are remotely controlled and sampling/analysis events are of short duration.			
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).			
Human factors not influenced by risk management	Exposed skin areas Palm of one hand (240cm2)			
Other operational conditions	Indoor use.			
affecting workers exposure				
Technical conditions and	Ensure that a mechanical ventilation is in place			
measures to control dispersion from source towards the worker				
	Wear chemically resistant gloves. (Efficiency: 90 %)			
Conditions and measures related to personal protection, hygiene	Wear a full face respirator conforming to EN136 with Type A/P2 filter or better. (Efficiency: 90 %)			
and health evaluation	Use suitable eye protection. Wear suitable protective clothing.			
3. Exposure estimation and reference to its source				

3. Exposure estimation and reference to its source

Environment

No exposure assessment presented for the environment.

Workers

P1680_005



Ferric chloride

Version 1.0

Print Date 16.04.2013

Revision Date 16.04.2013

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

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR	
PROC15	worst-case	Worker - inhalative, long- term - systemic	2,01mg/m ³	0,43	
PROC15	worst-case	Worker - dermal, long- term - systemic	0,01mg/m ³	0,01	
Evenesus is considered positivite					

Exposure is considered negligible.

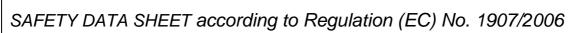
4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

For scaling see: http://www.ecetoc.org/tra

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Ensure that good work practices are implemented



Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

BRENNTAG

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites		
Process categories	PROC2: Use in closed, continuous process with occasional controlled exposure 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		
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles		
2.1 Contributing scenario co	ntrolling environmenta	exposure for: ERC4	
Product characteristics	Concentration of the Substance in Mixture/Article Covers concentrations of substance in production		
Amount used	Annual amount per site	540 ton(s)/year	
Amount used	Daily amount per site	1800 kg	
Frequency and duration of use	Continuous exposure	300 days/year	
Environment factors not influenced by risk management	Dilution Factor (River) 10		
Other given operational	Emission or Release Factor: Air	0 %	
conditions affecting environmental exposure	Emission or Release Factor: Water	1 %	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Wastewater release into municipal STP.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant	
	Flow rate of sewage treatment plant effluent	2.000 m3/d	
	Sludge Treatment	Recovery of sludge for agriculture or horticulture	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge	
	Disposal methods	Can be landfilled or incinerated, when in	

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

	compliance with local regulations.		
2.4 Contributing scenario co	controlling worker exposure for: PROC2, PROC8a, PROC8b		
	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
	Physical Form (at time of use)	solid	
	Frequency of use	300 days/year	
Frequency and duration of use	Covers daily exposures up	to 8 hours (unless stated differently).	
	Exposed skin areas	Palms of both hands (480 cm2) (PROC2, PROC8b	
Human factors not influenced by	Exposed skin areas	Two hands 960 cm ² (PROC8a)	
risk management	Breathing volume	10 m3/day	
-	Body weight	70 kg	
Other operational conditions	Indoor use.		
affecting workers exposure			
Technical conditions and measures to control dispersion from source towards the worker	Ensure that a mechanical ventilation is in place(PROC8a, PROC8b)		
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures(PROC2, PROC8a, PROC8b)		
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection. Wear suitable protective clothing.(PROC2, PROC8a, PROC8b) Wear chemically resistant gloves. (Efficiency: 90 %)(PROC2, PROC8a, PROC8b) Wear a respirator conforming to EN140 with Type A/P2 filter or better. (Efficiency: 90 %)(PROC8a, PROC8b)		
2.5 Contributing scenario co			
	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
	Frequency of use	300 days/year	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).		
	Exposed skin areas	Palms of both hands (480 cm2)	
Human factors not influenced by	Breathing volume	10 m3/day	
risk management	Body weight	70 kg	
P1680_005	22/50	E	

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

Other operational conditions affecting workers exposure	Indoor use.
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection. Wear suitable protective clothing. Wear chemically resistant gloves. (Efficiency: 90 %)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4		Fresh water sediment	PEC	45g/kg	0,9091
ERC4		Soil	PEC	50g/kg	0,9091
ERC4		Water	PEC	< 0,0001mg/L	< 0,0001

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2, PROC8a, PROC8b	worst-case	Worker - inhalative, long- term - systemic	2,01mg/m ³	0,43
PROC2, PROC8a, PROC8b	worst-case	Worker - dermal, long- term - systemic	0,3mg/kg bw/day	0,23
PROC5	worst-case	Worker - inhalative, long- term - systemic	2,01mg/m ³	0,43
PROC5	worst-case	Worker - dermal, long- term - systemic	0,3mg/kg bw/day	0,23

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.

For scaling see: http://www.ecetoc.org/tra

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

P1680_005



Ferric chloride

Version 1.0

Revision Date 16.04.2013

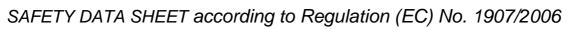
Print Date 16.04.2013

Additional good practice advice beyond the REACH Chemical Safety Assessment

Ensure that good work practices are implemented

P1680_005

24/50



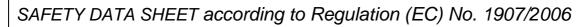
Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

BRENNTAG

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites		
Process categories	PROC2: Use in closed, continuous process with occasional controlled exposure 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		
Environmental Release Categories	ERC5: Industrial use resulting in inclusion into or onto a matrix		
2.1 Contributing scenario co	ontrolling environmenta	exposure for: ERC5	
Product characteristics	Concentration of the Substance in Mixture/ArticleCovers concentrations of substance in p 80%-100%		
	Annual amount per site	73 ton(s)/year (ERC4, ERC5)	
Amount used	Daily amount per site	200 kg (ERC4, ERC5)	
Frequency and duration of use	Continuous exposure	365 days/year	
	Dilution Factor (River)	10 (ERC4, ERC5)	
	Dilution Factor (River)	25 (ERC2)	
Environment factors not influenced by risk management	Dilution Factor (Coastal Areas)	250 (ERC2)	
	Other data. Other information	Local freshwater dilution factor:: 10 - 40 (ERC2)	
	Other data. Other information	Local marine water dilution factor:: 100 - 400 (ERC2)	
Other given operational	Emission or Release Factor: Air	0 %	
conditions affecting environmental exposure	Emission or Release Factor: Water	1	
Technical conditions and	Water	Wastewater release into municipal STP.	
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site			
Conditions and measures related to sewage treatment plant	Type of Sewage	Municipal sewage treatment plant	
to sewaye treatment plant	Flow rate of sewage	2.000 m3/d	
P1680 005	25/50	13	



Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

	treatment plant effluent		
	Sludge Treatment	Recovery of sludge for agriculture or horticulture	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste water treatment may vary at different sites Wastewater should be at least treated in either a on-site or a municipal secondary biological treatment plant prior to discharge	
uisposai	Disposal methods	Can be landfilled or incinerated, when in compliance with local regulations.	
2.3 Contributing scenario co	ntrolling worker exposu	re for: PROC2, PROC8a, PROC8b	
	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
	Physical Form (at time of use)	solid	
	Frequency of use	365 days/year	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).		
	Exposed skin areas	Palms of both hands (480 cm2) (PROC2, PROC8b)	
Human factors not influenced by	Exposed skin areas	Two hands 960 cm ² (PROC8a)	
risk management	Breathing volume	10 m3/day	
	Body weight	70 kg	
Other operational conditions	Indoor use.		
affecting workers exposure			
Technical conditions and measures to control dispersion from source towards the worker	Ensure that a mechanical ventilation is in place(PROC8a, PROC8b)		
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures(PROC2, PROC8a, PROC8b)		
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection. Wear suitable protective clothing.(PROC2, PROC8a, PROC8b) Wear a respirator conforming to EN140 with Type A/P2 filter or better. (Efficiency: 90 %)(PROC8b) Wear chemically resistant gloves. (Efficiency: 90 %)(PROC2, PROC8a, PROC8b)		
2.4 Contributing scenario co	ntrolling worker exposu	re for: PROC5	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
	Physical Form (at time of use)	liquid	
P1680_005	26/50	E	

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

	Vapour pressure	< 0,0001 hPa	
		< 0,0001 IIFa	
Frequency and duration of use	Frequency of use	365 days/year	
requency and duration of use	Covers daily exposures	up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Exposed skin areas	Palms of both hands (480 cm2)	
	Breathing volume	10 m3/day	
	Body weight	70 kg	
Other operational conditions	Indoor use.		
affecting workers exposure			
Organisational measures to	Provide basic employee	training to prevent/minimize exposures	
prevent /limit releases, dispersion and exposure			
Conditions and measures related	Use suitable eye protect		
to personal protection, hygiene	Wear suitable protective	e clothing.	
and health evaluation	Wear chemically resista	nt gloves. (Efficiency: 90 %)	

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4, ERC5		Fresh water sediment	PEC	45g/kg	0,9091
ERC4, ERC5		Soil	PEC	50,8g/kg	0,9236
ERC4, ERC5		Water	PEC	< 0,0001mg/L	< 0,0001

Workers

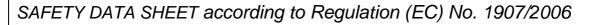
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2, PROC8a, PROC8b	worst-case	Worker - inhalative, long- term - systemic	2,01mg/m ³	0,43
PROC2, PROC8a, PROC8b	worst-case	Worker - dermal, long- term - systemic	0,3mg/kg bw/day	0,23
PROC5	worst-case	Worker - inhalative, long- term - systemic	2,01mg/m ³	0,43
PROC5	worst-case	Worker - dermal, long- term - systemic	0,3mg/kg bw/day	0,23

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the

P1680_005

27/50



Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

Exposure Scenario

The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.

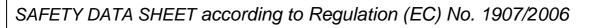
For scaling see: http://www.ecetoc.org/tra

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Ensure that good work practices are implemented

P1680_005



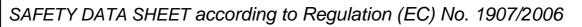
Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

BRENNTAG

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)			
	 PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations 			
Process categories	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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent			
Environmental Release Categories		ndoor use resulting in inclusion into or onto a matrix utdoor use resulting in inclusion into or onto a matrix		
2.1 Contributing scenario co	ntrolling environmental	exposure for: ERC8c, ERC8f		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).		
Frequency and duration of use	Continuous exposure	365 days/year		
	Dilution Factor (River)	25		
Environment factors not	Dilution Factor (Coastal Areas)	250		
nfluenced by risk management	Other data. Other information	Local freshwater dilution factor:10 - 40		
	Other data. Other information	Local marine water dilution factor:100 - 400		
Fechnical conditions and neasures at process level source) to prevent release	Water	It is required that the flow of release to municipal wastewater or to surface water do not cause significant in pH changes		
echnical onsite conditions and neasures to reduce or limit lischarges, air emissions and eleases to soil Organizational measures to prevent/limit release from the site				
Conditions and measures related o sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant		
		ire for: PROC1, PROC2, PROC3, PROC4,		



Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).	
Product characteristics	Physical Form (at time of use)	Aqueous solution	
	Vapour pressure	ca. 0,1 hPa	
Frequency and duration of use	Frequency of use	220 days/year	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).		
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.		
Technical conditions and	Provide for sufficient ventila	ation.	
measures to control dispersion from source towards the worker			
Organisational measures to	Ensure operatives are train	ed to minimise exposures.	
prevent /limit releases, dispersion and exposure			
Conditions and measures related	Chemically resistant gloves	s tested to EN374.(except PROC1, PROC2)	
to personal protection, hygiene and health evaluation			

3. Exposure estimation and reference to its source

Environment

Exposure is considered negligible.

Workers

MEASE

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15		Dermal worker exposure	< 0,69mg/kg bw/day	< 0,403

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

If measured data are not available, the DU may make use of an appropriate scaling tool such as MEASE (www.ebrc.de/mease.html) to estimate the associated exposure

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

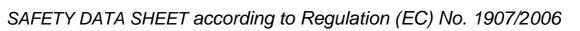
Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

P1680_005

30/50

ΕN



Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

BRENNTAG

Main User Groups	SU 3: Industrial uses: Use sites	es of substances as such or in preparations at industrial		
Process categories	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			
Environmental Release Categories	ERC2: Formulation of preparations ERC4: Industrial use of processing aids in processes and products, not becomin part of articles ERC6b: Industrial use of reactive processing aids			
2.1 Contributing scenario co	ntrolling environmenta	exposure for: ERC2, ERC4, ERC6b		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%		
Amount used	Annual amount per site	2,409 ton(s)/year		
Anount used	Daily amount per site	6,6 kg		
Frequency and duration of use	Continuous exposure	365 days/year		
Environment factors not influenced by risk management	Dilution Factor (River)	10		
Other given operational conditions affecting	Emission or Release Factor: Air	0 %		
environmental exposure	Emission or Release Factor: Water	1		
Technical conditions and measures at process level	Air	Due to enclosed process air emissions are unlikely, except during transfer to and from the digester		
(source) to prevent release Technical onsite conditions and	Water	Wastewater release into municipal STP.		
measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site				
	Type of Sewage Treatment Plant	Municipal sewage treatment plant		
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d		
	Sludge Treatment	Recovery of sludge for agriculture or horticulture		
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge		
	Disposal methods	Can be landfilled or incinerated, when in		

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

		compliance with local regulations.	
2.2 Contributing scenario co	ntrolling worker exposu	re for: PROC2, PROC8a, PROC8b	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).	
	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
	Physical Form (at time of use)	solid	
Frequency and duration of use	Frequency of use	365 days/year	
requency and duration of use	Covers daily exposures up	to 8 hours (unless stated differently).	
	Exposed skin areas	Palms of both hands (480 cm2) (PROC2, PROC8b)	
Human factors not influenced by	Exposed skin areas	Two hands 960 cm ² (PROC8a)	
risk management	Breathing volume	10 m3/day	
	Body weight	70 kg	
Other operational conditions	Indoor use.		
affecting workers exposure			
Technical conditions and	Ensure that a mechanical v	ventilation is in place(PROC8a, PROC8b)	
measures to control dispersion from source towards the worker			
Organisational measures to prevent /limit releases, dispersion	Provide basic employee training to prevent/minimize exposures(PROC2, PROC8a, PROC8b)		
and exposure	Use suitable eye protectior		
		 othing.(PROC2, PROC8a, PROC8b)	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant (PROC8b)	gloves. (Efficiency: 90 %)(PROC2, PROC8a,	
	Wear a respirator conforming to EN140 with Type A/P2 filter or better. (Efficiency: 90 %)(PROC8a, PROC8b)		
3. Exposure estimation and			

Environment

٦٢

Used EUSES	model.				
Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2, ERC4, ERC6b		Fresh water sediment	PEC	45g/kg	0,9091
ERC2, ERC4, ERC6b		Water	PEC	< 0,0001mg/L	< 0,0001
ERC2, ERC4, ERC6b		Soil	PEC	50,1g/kg	0,9109
P1680_005		32/50			E

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

Workers

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

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2, PROC8a, PROC8b	worst-case	Worker - inhalative, long- term - systemic	2,01mg/m ³	0,43
PROC2, PROC8a, PROC8b	worst-case	Worker - dermal, long- term - systemic	0,3mg/kg bw/day	

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.

For scaling see: http://www.ecetoc.org/tra Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment



Ferric chloride

Version 1.0

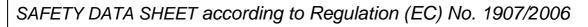
Revision Date 16.04.2013

Print Date 16.04.2013

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites		
Process categories	PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent PROC22: Potentially closed processing operations with minerals/metals at elevated temperature; industrial setting PROC26: Handling of solid inorganic substances at ambient temperature		
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becomin part of articles ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) ERC6b: Industrial use of reactive processing aids		
2.1 Contributing scenario co	ontrolling environmenta	l exposure for: ERC4, ERC5, ERC6a, ERC6b	
2.1 Contributing scenario co	Concentration of the Substance in Mixture/Article	I exposure for: ERC4, ERC5, ERC6a, ERC6b Covers concentrations of substance in product: 80%-100%	
Product characteristics	Concentration of the Substance in	Covers concentrations of substance in product:	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
-	Concentration of the Substance in Mixture/Article Annual amount per site	Covers concentrations of substance in product: 80%-100% 6000 ton(s)/year	
Product characteristics Amount used Frequency and duration of use Other given operational	Concentration of the Substance in Mixture/Article Annual amount per site Daily amount per site	Covers concentrations of substance in product: 80%-100% 6000 ton(s)/year 20 tonnes	
Product characteristics Amount used Frequency and duration of use Other given operational conditions affecting environmental exposure	Concentration of the Substance in Mixture/Article Annual amount per site Daily amount per site Continuous exposure Emission or Release	Covers concentrations of substance in product: 80%-100% 6000 ton(s)/year 20 tonnes 300 days/year	
Product characteristics Amount used Frequency and duration of use Other given operational conditions affecting	Concentration of the Substance in Mixture/Article Annual amount per site Daily amount per site Continuous exposure Emission or Release Factor: Air Emission or Release	Covers concentrations of substance in product: 80%-100% 6000 ton(s)/year 20 tonnes 300 days/year 0 %	

P1680_005

EN



Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

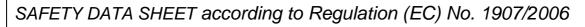
		1	
	Flow rate of sewage treatment plant effluent	2.000 m3/d	
	Sludge Treatment	Recovery of sludge for agriculture or horticulture	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge	
uisposai	Disposal methods	Can be landfilled or incinerated, when in compliance with local regulations.	
2.2 Contributing scenario co	ntrolling worker exposu	re for: PROC2, PROC3	
	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
	Physical Form (at time of use)	solid	
Frequency and duration of use	Frequency of use	300 days/year	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).		
	Exposed skin areas	Palms of both hands (480 cm2) (PROC2)	
Human factors not influenced by	Exposed skin areas	Palm of one hand (240cm2) (PROC3)	
risk management	Breathing volume	10 m3/day	
	Body weight	70 kg	
Other operational conditions	Indoor use.		
affecting workers exposure			
Organisational measures to prevent /limit releases, dispersion	Provide basic employee training to prevent/minimize exposures(PROC2, PROC3)		
and exposure Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves. Use suitable eye protection. (Efficiency: 90 %)(PROC2, PROC3)		
2.3 Contributing scenario co PROC26	ntrolling worker exposu	re for: PROC4, PROC9, PROC15, PROC22,	
	Concentration of the		

	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
Francisco and dimetion of use	Frequency of use	300 days/year	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).		

P1680_005

35/50

EN



Version 1.0

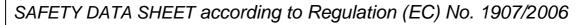
Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

	Expose	ed skin areas	Palms of both har	nds (480 cm2) (PF	OC4. PROC9)
	· · ·	ed skin areas	Palm of one hand	. , .	
Human factors not influenced by risk management		ed skin areas	More than hands (PROC22, PROC	and forearms. 198	,
-	Breathi	ng volume	10 m3/day		
	Body w	reight	70 kg		
Other operational conditions affecting workers exposure	Indoor	Indoor use.			
Organisational measures to prevent /limit releases, dispersion and exposure		e basic employee trai 9, PROC15, PROC22		nimize exposures	(PROC4,
Conditions and measures related to personal protection, hygiene and health evaluation	Wear c	itable eye protection. hemically resistant gl 22, PROC26)			
2.4 Contributing scenario co	ntrollin	g worker exposur	e for: PROC8b		
Product characteristics	Substa	ntration of the nce in /Article	Covers concentrations of substance in product: 80%-100%		e in product:
	Physica use)	al Form (at time of	solid		
Frequency and duration of use	Freque	ncy of use	300 days/year		
requercy and duration of use	Covers daily exposures up to 8 hours (unless stated differently).				
	Exposed skin areas Palms of both hands (480 cm2) (PROC8b)				
Human factors not influenced by risk management	Breathi	ning volume 10 m3/day			
non management	Body weight 70 kg				
Other operational conditions affecting workers exposure	Indoor	use.			
Technical conditions and	Provide	e local exhaust ventila	ation (LEV). (Efficie	ency: 90 %)	
measures to control dispersion from source towards the worker			· · · ·		
Organisational measures to prevent /limit releases, dispersion and exposure	Provide	e basic employee trai	ning to prevent/mi	nimize exposures	
Conditions and measures related		itable eye protection.			
to personal protection, hygiene	Wear c	hemically resistant g	oves. (Efficiency:	90 %)	
and health evaluation	-				
3. Exposure estimation and	reterer	ice to its source			
Environment					
Used EUSES model.					
Contributing Specific cond	itions	Compartment	Value	Level of	RCR

Contributing
ScenarioSpecific conditionsCompartmentValueLevel of
ExposureRCRP1680_00536/50EN



Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

ERC4, ERC5, ERC6a, ERC6b	 Soil	PEC	50,8g/kg	0,9236
ERC4, ERC5, ERC6a, ERC6b	 Fresh water sediment	PEC	45g/kg	0,9091
ERC4, ERC5, ERC6a, ERC6b	 Water	PEC	< 0,0001mg/L	< 0,0001

Workers

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

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2, PROC3	worst-case	Worker - dermal, long- term - systemic	0,7mg/kg bw/day	0,54
PROC2, PROC3	worst-case	Worker - inhalative, long- term - systemic	1,8mg/m ³	0,39
PROC4, PROC9, PROC15, PROC22, PROC26	worst-case	Worker - dermal, long- term - systemic	0,7mg/kg bw/day	0,54
PROC4, PROC9, PROC15, PROC22, PROC26	worst-case	Worker - inhalative, long- term - systemic	1,8mg/m³	0,39
PROC8b	worst-case	Worker - dermal, long- term - systemic	0,7mg/kg bw/day	0,54
PROC8b	worst-case	Worker - inhalative, long- term - systemic	1,8mg/m ³	0,39

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.

For scaling see: http://www.ecetoc.org/tra

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment



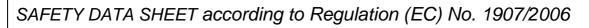
Ferric chloride

Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

Main User Groups	SU 3: Industrial uses: Use sites	s of substances as such or in preparations at industrial		
Process categories	 PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC7: Industrial spraying 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 PROC13: Treatment of articles by dipping and pouring 			
Environmental Release Categories	ERC2: Formulation of prep ERC6b: Industrial use of re			
2.1 Contributing scenario co	ntrolling environmental	exposure for: ERC2, ERC6b		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%		
Amount used	Annual amount per site	50,100 ton(s)/year		
Amount used	Daily amount per site	167 kg		
Frequency and duration of use	Continuous exposure	300 days/year		
Environment factors not influenced by risk management	Dilution Factor (River)	10		
Other given operational conditions affecting	Emission or Release Factor: Air	0 %		
environmental exposure	Emission or Release Factor: Water	2 %		
Technical conditions and	Water	Wastewater release into municipal STP.		
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site				
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant		
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d		
	Sludge Treatment	Recovery of sludge for agriculture or horticulture		
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge		
P1680 005	38/50	EN		



Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

	Disposal methods	Can be landfilled or incinerated, when in compliance with local regulations.	
2.2 Contributing scenario co	ntrolling worker exposu	re for: PROC5, PROC7, PROC13	
	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
Frequency and duration of use	Frequency of use	300 days/year	
Frequency and duration of use	Covers daily exposures up	to 8 hours (unless stated differently).	
	Exposed skin areas	Palms of both hands (480 cm2) (PROC5, PROC13)	
Human factors not influenced by	Exposed skin areas	Palm of one hand (240cm2) (PROC7)	
risk management	Breathing volume	10 m3/day	
	Body weight	70 kg	
Technical conditions and	Spraying	Use product only in closed system.	
measures to control dispersion			
from source towards the worker Organisational measures to		aining to prevent/minimize exposures	
prevent /limit releases, dispersion and exposure	Regular cleaning of equipn	nent and work area	
Conditions and measures related			
to personal protection, hygiene and health evaluation			
2.3 Contributing scenario co	ntrolling worker exposu	re for: PROC8a, PROC8b	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
	Physical Form (at time of use)	solid	
Frequency and duration of use	Frequency of use	300 days/year	
Frequency and duration of use	Covers daily exposures up	to 8 hours (unless stated differently).	
	Exposed skin areas	Palms of both hands (480 cm2)	
Human factors not influenced by	Breathing volume	10 m3/day	
risk management	Body weight	70 kg	
Technical conditions and	Provide local exhaust venti	lation (LEV).	
measures to control dispersion from source towards the worker			
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee tra Regular cleaning of equipn	aining to prevent/minimize exposures nent and work area	
Conditions and measures related	Wear chemically resistant		
to personal protection, hygiene and health evaluation	Use suitable eye protection.		
P1680 005	39/50	EN	

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2, ERC6b		Fresh water sediment	PEC	45g/kg	0,9091
ERC2, ERC6b		Soil	PEC	51,8g/kg	0,9418
ERC2, ERC6b		Water	PEC	< 0,0001mg/L	< 0,0001

Workers

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

Contributing Scenario	Specific conditions	Exposure routes Level of Exposure		RCR
PROC5, PROC7, PROC13	worst-case	Worker - dermal, long- term - systemic	0,14mg/kg bw/day	0,11
PROC5, PROC7, PROC13	worst-case	Worker - inhalative, long- term - systemic	1,8mg/m³	0,39
PROC8a, PROC8b	worst-case	Worker - dermal, long- term - systemic	0,14mg/kg bw/day	0,11
PROC8a, PROC8b	worst-case	Worker - inhalative, long- term - systemic	1,8mg/m ³	0,39

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.

For scaling see: http://www.ecetoc.org/tra

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment



Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

BRENNTAG

1. Short title of Exposure Scenario 14: Use in metal surface treatment.

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)		
Chemical product category	PC14: Metal surface treatment products, including galvanic and electroplating products		
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems		

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

No exposure assessment presented for the environment.

2.2 Contributing scenario controlling consumer exposure for: PC14

	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 40 %
Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	< 0,0001 hPa
Other given operational	Indoor and outdoor use.	
conditions affecting consumers exposure		
Conditions and measures related	Consumer Measures	Wear suitable gloves.
to protection of consumer (e.g. behavioural advice, personal protection and hygiene)		

3. Exposure estimation and reference to its source

Environment

No exposure assessment presented for the environment.

Consumers

ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC14	worst-case	Consumer - dermal, long- term - systemic	< 0,36mg/kg bw/day	< 0,86

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

For scaling see: http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp

P1680_005

41/50

ΕN



Ferric chloride

Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the $\ensuremath{\mathsf{ES}}$

P1680_005



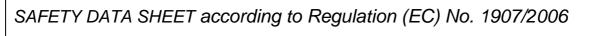
Ferric chloride

Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

1. Short title of Exposure Sco	ſ			
Main User Groups	SU 3: Industrial uses: Use sites	s of substances as such or in preparations at industria		
Process categories	 PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC7: Industrial spraying 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC12: use of blowing agents in manufacture of foam PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelettisation 			
Environmental Release Categories	ERC5: Industrial use resulting in inclusion into or onto a matrix			
2.1 Contributing scenario co	ntrolling environmental	exposure for: ERC5		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).		
Amount used	Annual amount per site	60 ton(s)/year		
	Daily amount per site	200 kg		
Frequency and duration of use	Continuous exposure	300 days/year		
Other given operational conditions affecting	Emission or Release Factor: Air	0 %		
environmental exposure	Emission or Release Factor: Water	2 %		
Technical conditions and	Water	Wastewater release into municipal STP.		
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site				
	Type of Sewage Treatment Plant	Municipal sewage treatment plant		
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d		
	Sludge Treatment	Recovery of sludge for agriculture or horticulture		
P1680 005	43/50	E		



BRENNTAG

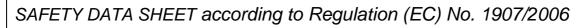
Print Date 16.04.2013

Ferric chloride

Version 1.0

Revision Date 16.04.2013

Waste water treatment may vary at different sites. Wastewater should be at least treated in either an Waste treatment Conditions and measures related on-site or a municipal secondary biological to external treatment of waste for treatment plant prior to discharge disposal Can be landfilled or incinerated, when in Disposal methods compliance with local regulations. 2.2 Contributing scenario controlling worker exposure for: PROC5, PROC8a, PROC8b, PROC9, PROC12, PROC14 Concentration of the Covers concentrations of substance in product: Substance in 80%-100% Mixture/Article Physical Form (at time of liquid Product characteristics use) Vapour pressure < 0,0001 hPa Physical Form (at time of solid use) Frequency of use 300 days/year Frequency and duration of use Covers daily exposures up to 8 hours (unless stated differently). Palms of both hands (480 cm2) (PROC5, PROC8b, Exposed skin areas PROC9, PROC14) Two hands 960 cm² (PROC8a) Exposed skin areas Human factors not influenced by Palm of one Hand 240 cm² (PROC12) Exposed skin areas risk management Breathing volume 10 m3/dav 70 kg Body weight Indoor use. Other operational conditions affecting workers exposure Technical conditions and Ensure that a mechanical ventilation is in place(PROC5, PROC8a, PROC8b, measures to control dispersion PROC9, PROC12, PROC14) from source towards the worker Organisational measures to Provide basic employee training to prevent/minimize exposures(PROC5, prevent /limit releases, dispersion PROC8a, PROC8b, PROC9, PROC12) and exposure Wear chemically resistant gloves. (Efficiency: 90 %)(PROC5, PROC8a, PROC8b, PROC9, PROC12) Conditions and measures related Wear a respirator conforming to EN140 with Type A/P2 filter or better. to personal protection, hygiene (Efficiency: 90 %)(PROC5, PROC8a, PROC8b, PROC9, PROC12, PROC14) and health evaluation Use suitable eye protection. Wear suitable protective clothing.(PROC5, PROC8a, PROC8b, PROC9, PROC12, PROC14) 2.3 Contributing scenario controlling worker exposure for: PROC7, PROC10, PROC13 Concentration of the Covers concentrations of substance in product: Product characteristics Substance in 80%-100% Mixture/Article P1680 005 44/50 EN



Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

	Physical Form (at time of use)	liquid		
	Vapour pressure	< 0,0001 hPa		
	Frequency of use	300 days/year		
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).			
	Exposure duration 240 min(PROC7)			
	Exposed skin areas	Hands and forearms. 1500 cm ² (PROC7)		
	Exposed skin areas	Two hands 960 cm ² (PROC10)		
Human factors not influenced by risk management	Exposed skin areas	Palms of both hands (480 cm2) (PROC13)		
nsk management	Breathing volume	10 m3/day		
	Body weight	70 kg		
••••••	Indoor use.(PROC10, PRO	C13)		
Other operational conditions affecting workers exposure	Indoor and outdoor use.(PROC7)			
anecting workers exposure				
Technical conditions and	Ensure that a mechanical ventilation is in place(PROC10)			
measures to control dispersion	Carry out in a vented booth or extracted enclosure.			
from source towards the worker	Provide local exhaust ventilation (LEV).(Indoor PROC7) Ensure containment of the emission source(Outdoor PROC7)			
Organisational measures to prevent /limit releases, dispersion	Provide basic employee tra	ining to prevent/minimize exposures(PROC7,		
and exposure				
	Wear chemically resistant gloves. (Efficiency: 90 %)(PROC7, PROC10, PROC13)			
	Use suitable eye protection. Wear suitable protective clothing.(PROC7, PROC10, PROC13)			
Conditions and measures related	in teeninear exhauet er vertilation medearee are net peeelole er meanelent,			
to personal protection, hygiene and health evaluation	respiratory protection must be worn.			
	Wear a full face respirator TM3 conforming to EN147 with type A filter or better (Efficiency: 95 %)(Indoor PROC7)			
	or Wear a full face respirator TM3 conforming to EN147 with type A filter or better (Efficiency: 95 %)(Outdoor PROC7)			

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC5		Soil	PEC	50g/kg	0,9091
ERC5		Fresh water sediment	PEC	45g/kg	0,9091
ERC5		Water	PEC	< 0,0001mg/L	< 0,0001

P1680_005

ΕN

Ferric chloride

Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

Workers

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

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC5, PROC8a, PROC8b, PROC9, PROC12, PROC14	worst-case	Worker - inhalative, long- term - systemic	2,2mg/m ³	0,48
PROC5, PROC8a, PROC8b, PROC9, PROC12, PROC14	worst-case	Worker - dermal, long- term - systemic	0,3mg/kg bw/day	0,21
PROC10, PROC13	worst-case	Worker - inhalative, long- term - systemic	2,2mg/m ³	0,48
PROC7, PROC10, PROC13	worst-case	Worker - dermal, long- term - systemic	0,3mg/kg bw/day	0,21
PROC7	worst-case	Worker - inhalative, long- term - systemic	3,3mg/m ³	0,72

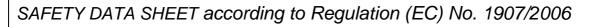
4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.

For scaling see: http://www.ecetoc.org/tra

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment



Version 1.0

Revision Date 16.04.2013

Print Date 16.04.2013

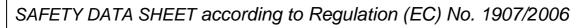
BRENNTAG

1. Short title of Exposure Sce	enario 16: Use in adhesi	ves and sealants		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)			
Process categories	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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC19: Hand-mixing with intimate contact and only PPE available			
Environmental Release Categories		door use resulting in inclusion into or onto a matrix Itdoor use resulting in inclusion into or onto a matrix		
2.1 Contributing scenario co	ntrolling environmental	exposure for: ERC8c, ERC8f		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%		
Amount used	Annual amount per site	12,300 ton(s)/year		
	Daily amount per site	41 kg		
Frequency and duration of use	Continuous exposure	300 days/year		
Environment factors not influenced by risk management	Dilution Factor (River)	10		
	Emission or Release Factor: Air	0 %		
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	2 %		
environmental expected	Emission or Release Factor: Soil	0 %		
6 III	Type of Sewage Treatment Plant	Municipal sewage treatment plant		
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d		
	Sludge Treatment	Recovery of sludge for agriculture or horticulture		
Conditions and measures related to external treatment of waste for	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge		
disposal	Disposal methods Collect all unused material for disposal as hazardous waste in compliance with local a national regulations			
2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC8b, PROC9, PROC19				

P1680_005

47/50

ΕN



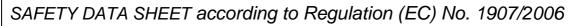
Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
	Physical Form (at time of use)	solid	
Frequency and duration of use	Frequency of use	300 days/year	
requercy and duration of use	Covers daily exposures up	to 8 hours (unless stated differently).	
	Exposed skin areas	Two hands 960 cm ² (PROC8a)	
	Exposed skin areas	Palms of both hands (480 cm2) (PROC8b, PROC9)	
Human factors not influenced by risk management	Exposed skin areas	More than hands and forearms. 1980 cm ² (PROC19)	
	Breathing volume	10 m3/day	
	Body weight	70 kg	
Other operational conditions	Indoor use.		
affecting workers exposure			
Technical conditions and measures to control dispersion	Ensure that a mechanical ventilation is in place(PROC8a, PROC8b, PROC9, PROC19)		
from source towards the worker			
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures(PROC8a, PROC8b, PROC9, PROC19)		
	Use suitable eye protection.		
Conditions and measures related to personal protection, hygiene	Wear suitable protective clothing.(PROC8a, PROC8b, PROC9, PROC19) Wear a respirator conforming to EN140 with Type A/P2 filter or better. (Efficiency: 90 %)(PROC8a, PROC8b, PROC9, PROC19)		
and health evaluation	Wear chemically resistant gloves. (Efficiency: 90 %)(PROC8a, PROC8b, PROC9, PROC19)		
2.3 Contributing scenario co	ntrolling worker exposu	re for: PROC10, PROC11, PROC13	
	Concentration of the Substance in Mixture/Article	Covers concentrations of substance in product: 80%-100%	
Product characteristics	Physical Form (at time of use)	liquid	
	Vapour pressure	< 0,0001 hPa	
	Frequency of use	300 days/year	
Freewood at the f		to 8 hours (unless stated differently).	
Frequency and duration of use	Exposure duration	240 min(PROC11)	
	Frequency of use	3 days/week(PROC11)	
Human factors not influenced by	Exposed skin areas	Two hands 960 cm ² (PROC10)	
Human factors not influenced by risk management	Exposed skin areas Exposed skin areas	Hands and forearms. 1500 cm ² (PROC10)	



Version 1.0

Print Date 16.04.2013

BRENNTAG

Revision Date 16.04.2013

	Exposed skin areas	Palms of both hands (480 cm2) (PROC13)	
	Breathing volume	10 m3/day	
	Body weight	70 kg	
	Indoor use.(PROC10, PF	ROC13)	
Other operational conditions affecting workers exposure	Indoor and outdoor use.(PROC11)	
anceang workers exposure			
Technical conditions and measures to control dispersion	Carry out in a vented booth or extracted enclosure. Provide local exhaust ventilation (LEV).(Indoor PROC11)		
from source towards the worker	Ensure containment of th	ne emission source(Outdoor PROC11)	
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures Clean equipment and the work area every day.(PROC10, PROC11, PROC13)		
Conditions and measures related to personal protection, hygiene	Use suitable eye protection. Wear suitable protective clothing.(PROC10, PROC11, PROC13) Wear chemically resistant gloves. (Efficiency: 90 %)(PROC10, PROC11, PROC13) If no LEV or vented laminar spray booth available.		
and health evaluation	Wear a full face respirator TM3 conforming to EN147 with type A filter or better (Efficiency: 95 %)(Indoor PROC11) or Wear a full face respirator TM3 conforming to EN147 with type A filter or better (Efficiency: 95 %)(Outdoor PROC11)		

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8c, ERC8f		Soil	PEC	50g/kg	0,9091
ERC8c, ERC8f		Fresh water sediment	PEC	45g/kg	0,9091
ERC8c, ERC8f		Water	PEC	< 0,0001mg/L	< 0,0001

Workers

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

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC8a, PROC8b, PROC9, PROC19	worst-case	Worker - inhalative, long- term - systemic	2,2mg/m ³	0,48
PROC8a,	worst-case	Worker - dermal, long-	0,27mg/kg bw/day	0,21

P1680_005



Ferric chloride

Version 1.0

Print Date 16.04.2013

Revision Date 16.04.2013

PROC8b, PROC9, PROC19		term - systemic		
PROC11	worst-case	Worker - inhalative, long- term - systemic	3,3mg/m ³	0,72
PROC11	worst-case	Worker - dermal, long- term - systemic	0,3mg/kg bw/day	0,21
PROC10, PROC13	worst-case	Worker - dermal, long- term - systemic	0,27mg/kg bw/day	0,21

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.

For scaling see: http://www.ecetoc.org/tra

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment



DISTRIBUTOR COMPANY INFORMATION					
name	BRENNTAG N.V.	BRENNTAG Nederland B.V.	BRENNTAG SOUTH AFRICA (PTY) LTD		
address	Nijverheidslaan 38 8540 Deerlijk	Donker Duyvisweg 44 3316 BM Dordrecht	11 Mansell Road Killarney Gardens, 7441		
country	Belgium	The Netherlands	South Africa		
phone number	+32 (0)56 77 69 44	+31 (0)78 65 44 944	+27 (0)21 0201800		
website	www.brenntag.be	www.brenntag.nl	www.brenntag.co.za		
e-mail	info@brenntag.be	info@brenntag.nl	info@brenntag.co.za		
activities	Distributi	on and export of chemicals and	d ingredients		
VAT number	BE0405317567	NL001375945B01	4740102209		
emergency number(24/365)	+32 (0)56 77 69 44	+31 (0)78 6544 944	+27 (0)21 0201800		
management systems: certifications	ISO 9001, ISO 14001, ISO 22000, FSSC 22000, GMP+ Feed, ESAD	ISO 9001, ISO 14001, ISO 22000, FSSC 22000, OHSAS 18001, GMP+ Feed, ESAD, AEO	ISO 9001, FSSC 22000		

