Safety data sheet
according to 1907/2006/EC, Article 31

August 9, 2016 **Version number 3** **Revision: 30.03.2015**

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name: **FERROUS SULPHATE HEPTAHYDRATE (20)**
CAS Number: 7782-63-0
EC number: 231-753-5
Index number: 026-003-01-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses of the substance or mixture
Precipitant and flocculant
Municipal sewage treatment
Water treatment
Use in land remediation
Chromate reduction in cement
Fertiliser production
Chlorosis control

Uses advised against None

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier:
Angus Horticulture Ltd
Polmood
Guthrie
Forfar
DD8 2TW
Tel: 01241 829049
sales@angus-horticulture.co.uk

1.4 EMERGENCY TELEPHONE NUMBER: Tel.: 01674 674253

SECTION 2: Hazards identification

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2.1 Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008


GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2 H319 Causes serious eye irritation.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC


R22


Xn; Harmful

Harmful if swallowed.

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Xi; Irritant

R36/38: Irritating to eyes and skin.

(Contd. of page 1)

2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008 The substance is classified and labelled according to the CLP regulation.
Hazard pictograms

GHS07

Signal word Warning

Hazard-determining components of labelling: Ferrous sulphate heptahydrate
Hazard statements
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary statements

P280	Wear protective gloves / eye protection.
P301+P312	IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.

SECTION 3: Composition/information on ingredients

3.1 Chemical characterization: Substances
CAS No. Designation: 7782-63-0 iron(II) sulfate (1:1) heptahydrate
EC number: 231-753-5
Index number: 026-003-01-4

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SECTION 4: First aid measures

4.1 Description of first aid measures

After inhalation: Supply fresh air; consult doctor in case of symptoms.

After skin contact: Instantly wash with water and soap and rinse thoroughly.
If skin irritation continues, consult a doctor.

After eye contact: Rinse opened eye for several minutes under running water. Then consult doctor.

After swallowing: Rinse out mouth and then drink plenty of water.
Call a doctor immediately.

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4.2 Most important symptoms and effects, both acute and delayed No further relevant information available.

4.3 Indication of any immediate medical attention and special treatment needed No further relevant information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media
Suitable extinguishing agents: Use fire fighting measures that suit the environment.
CO_2, extinguishing powder or water jet. Fight larger fires with water jet.

5.2 Special hazards arising from the substance or mixture Sulphur dioxide (SO_2)

5.3 Advice for firefighters
Protective equipment: Put on breathing apparatus.
Wear full protective suit.
Use protective measures that suit the hazard conditions.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures Wear protective equipment.

6.2 Environmental precautions: Do not allow to enter the ground/soil.
Do not allow to enter drainage system, surface or ground water.
If material reaches soil inform authorities responsible for such cases.
Inform respective authorities in case product reaches water or sewage system.

6.3 Methods and material for containment and cleaning up: Collect mechanically.
Dispose of contaminated material as waste according to item 13.

6.4 Reference to other sections See Section 8 for information on personal protection equipment.
See Section 13 for information on disposal.

SECTION 7: Handling and storage

Handling:
7.1 Precautions for safe handling No special precautions necessary if used correctly.
Information about protection against explosions and fires: The product is not inflammable.

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7.2 Conditions for safe storage, including any incompatibilities Requirements to be met by storerooms and containers: Suitable material for containers and pipes: Plastics and steel.

Information about storage in one common storage facility: Not required.

Further information about storage conditions: Store under dry conditions.
Protect from heat and direct sunlight.
Storage temperature <30 °C

7.3 Specific end use(s) There are no further specific end uses than those named in section 1.2.

* **SECTION 8: Exposure controls/personal protection**

Additional information about design of technical systems: No further data; see item 7.

8.1 Control parameters
Components with critical values that require monitoring at the workplace:

DNELs

Oral (Consumer): 99.6 mg/kg/d (Acute systemic effects)
1.40 mg/kg/d (Systemic long-term effects)
Dermal (Consumer): 6.97 mg/kg/d (Systemic long-term effects)
(Worker): 13.95 mg/kg/d (Systemic long-term effects)

PNECs Iron is an essential trace element for fish, aquatic invertebrates and plants. A direct toxicity could not be demonstrated in tests. Therefore no PNEC was derived.

8.2 Exposure controls Information related to exposure control can be found in the respective exposure scenarios in the annex of the SDS.

Personal protective equipment:
General protective and hygienic measures: Listed in section 8 are the general personal protection measures corresponding to the standard of the chemical industry.
Specific information and detailed requirements are referred to in the exposure scenarios in the annex of the SDS.
The usual precautionary measures should be adhered to in handling the chemicals.

Breathing equipment: Details can be found in the exposure scenarios in the annex of the SDS.

Protection of hands: Requirements according to EN 420
Check protective gloves prior to each use for their proper condition.
Preventive skin protection by use of skin-protecting agents is recommended.

Material of gloves Details on the material can be found in the exposure scenarios in the annex of the SDS.

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Penetration time of glove material	Details can be found in the exposure scenarios in the annex of the SDS.
Eye protection:	Tightly sealed safety glasses.
Body protection:	Protective work clothing.
Limitation and supervision of exposure into the environment	Information related to exposure control can be found in the respective exposure scenarios in the annex of the SDS.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information

Appearance:	
Form:	Crystalline
Colour:	Greenish
Smell:	Odourless
Odour threshold:	Not determined.
pH-value (400 g/l) at 20 °C:	3.6
Melting point/Melting range:	ca. 64 °C
Boiling point/Boiling range:	Not applicable
Flash point:	Not applicable
Flammability (solid, gaseous):	Product is not inflammable.
Ignition temperature:	Not applicable
Decomposition temperature:	Not applicable
Self-flammability:	Product is not selfigniting.
Danger of explosion:	Product is not explosive.
Vapour pressure:	Not applicable.
Density:	1.89 g/cm³
Apparent density at 20 °C:	0.8 - 0.9 kg/l
Vapour density	Not applicable.
Evaporation rate	Not applicable.
Solubility in / Miscibility with Water at 10 °C:	365 g/l
Partition coefficient (n-octanol/water):	Not applicable

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Viscosity:
dynamic at 20 °C: 3 mPas
(solution containing 365 g/l)

9.2 Other information No further relevant information available.

SECTION 10: Stability and reactivity

10.1 Reactivity The substance is stable under normal use conditions.

10.2 Chemical stability
Thermal decomposition / Conditions to be avoided: No decomposition if used and stored according to specifications.
Loss of constitutional water on heating

10.3 Possibility of hazardous reactions Not relevant

10.4 Conditions to avoid No further data; see item 7.

10.5 Incompatible materials: No further data; see item 7.

10.6 Hazardous decomposition products: No dangerous decomposition products known

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:
LD/LC50 values that are relevant for classification:

Oral LD50 1096 mg/kg (rat) (OECD 423)
Dermal LD50 >2000 mg/kg (rat) (OECD 402)
Inhalative LC50 (-)
no relevant data available

Primary irritant effect:
on the skin: OECD 404:
Irritant for skin and mucous membranes.
on the eye: OECD 405:
Irritant effect.

Sensitisation: OECD 429 (LLNA-test):
No sensitizing effects.

Subacute to chronic toxicity:

Oral NOAEL 274 mg/kg/d (rat) (OECD 422)

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Dermal NOAEL (-)
no relevant data available
Inhalative NOAEC (-)
no relevant data available

CMR effects (carcinogenity, mutagenicity and toxicity for reproduction)	There are no indications of CMR effects.
Specific target organ toxicity (STOT)	No specific target organ toxicity according to the criteria defined in Regulation (EC) No. 1272/2008.
Aspiration hazard	Not relevant

SECTION 12: Ecological information

12.1 Toxicity	Data are experimentally not accessible. Under standard test conditions, the ferrous ion, Fe2+, is unstable and is oxidised to the ferric, Fe3+, ion. Ferric iron salts have a high rate of conversion to insoluble ferric hydroxide, in consequence, Fe2+ is to a great extent removed from the test system. Furthermore, iron plays an important role in biological processes, with iron homeostasis being under strict control. In conclusion, iron is not considered to be toxic to the aquatic environment under normal conditions.
12.2 Persistence and degradability	Not relevant for inorganic substances.
12.3 Bioaccumulative potential	Iron is a bioessential trace element for organisms and plays an important role in biological processes. The uptake of iron is strictly controlled by homeostatic process. In conclusion, bioaccumulation poses no concern.
12.4 Mobility in soil	The substance is immobile in soil.
Additional ecological information:	
AOX-indication:	<2 mg/kg
12.5 Results of PBT and vPvB assessment	The product is an inorganic substance and does not fulfill the criteria for PBZ and vPvB according to Annex XIII of REACH.
PBT:	Not applicable.
vPvB:	Not applicable.
12.6 Other adverse effects	No further relevant information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
European waste catalogue Waste code number according to origin of waste

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Uncleaned packagings:
Recommendation: Disposal according to official regulations

SECTION 14: Transport information

14.1 UN-Number
ADR Not dangerous according to transport specifications.
ADN, IMDG, IATA not applicable
14.2 UN proper shipping name
ADR, ADN, IMDG, IATA not applicable
14.3 Transport hazard class(es)

ADR, ADN, IMDG, IATA
Class not applicable
14.4 Packing group
ADR, IMDG, IATA not applicable
14.5 Environmental hazards No environmentally hazardous substance.
14.6 Special precautions for user None
14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Listed.

SECTION 15: Regulatory information

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

National regulations:

Water hazard class: Water hazard class 1: slightly hazardous for water.

Other regulations, limitations and prohibitive regulations:
to observe: Technical Information 2.02 "Transport, Storage and Metering: Granules"

15.2 Chemical Safety Assessment
Substances of very high concern (SVHC) according to REACH, Article 57 The product is not listed as SVHC, it does not contain any substances of very high concern.
Chemical safety assessment: A Chemical Safety Assessment has been carried out.

SECTION 16: Other information

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.

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FERROUS SULPHATE HEPTAHYDRATE (20)

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Abbreviations and acronyms:

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: International Civil Aviation Organisation
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
DNEL: Derived No-Effect Level (REACH)
PNEC: Predicted No-Effect Concentration (REACH)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
Acute Tox. 4: Acute toxicity, Hazard Category 4
Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2

*** Data compared to the previous version altered.**

Amended according to Regulation (EU) no 431/2010

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* **Annex: Exposure scenario 1**

1. Short title of the exposure scenario	ES 1: Industrial use of FERROUS SULPHATE HEPTAHYDRATE (20)
2. Description of activities/ process(es) covered in the Exposure Scenario	Water treatment: treatment of waste water and WWTP sludge Water treatment: Use in the treatment of raw water in the supply of potable water and/or industrial process water H2S-Elimination in biogas and water treatment plants Use in manufacture of cement (reduction of chromates) Land remediation application Use in agrochemicals Use as laboratory reagent Production of mixtures and solutions
Sector of Use	SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
Process category	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) PROC7 Industrial spraying 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 PROC26 Handling of solid inorganic substances at ambient temperature
Environmental release category	ERC2 Formulation of preparations ERC4 Industrial use of processing aids in processes and products, not becoming part of articles ERC5 Industrial use resulting in inclusion into or onto a matrix ERC6b Industrial use of reactive processing aids ERC8a Wide dispersive indoor use of processing aids in open systems ERC8e Wide dispersive outdoor use of reactive substances in open systems ERC8d Wide dispersive outdoor use of processing aids in open systems
3. Conditions of use **3.1 Duration and frequency** **Worker**	5-7 workdays/week Regular use with exposure up to 8 hours per workday.
Environment	Annual tonnage per site: up to 2000 t (Fe)

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	Typical amount per lot: 25 t (product) Emission day per site: 365
4. Physical parameters **4.1 Physical state**	Solid Granulate
4.2 Concentration of the substance in the mixture	Raw material.
4.2 Concentration of substance In solution	max. 500 g/l
5. Other operational conditions determining exposure 5.1 Other operational conditions affecting environmental exposure	None
5.2 Other operational conditions affecting worker exposure	None
5.3 Other operational conditions affecting consumer exposure	Not relevant for this Exposure Scenario.
5.4 Other operational conditions affecting consumer exposure during the use of the product	Not relevant for this Exposure Scenario.
6.1 Risk management measures **6.2 Worker protection** **6.2.1 Organisational protective measures**	Handling procedures must be well documented. Provide Internal Plant Instruction. Ensure that activities are executed by specialists or authorised personnel only.
6.2.2 Technical protective measures	No special precautions necessary if used correctly.
6.2.3 Personal protective measures	General measures corresponding to the standard of the chemical industry: see SDS section 8 . Material of gloves and resistence: Polychloroprene Resistance to: Sulphuric acid Value for the permeation: Level ≥ 6 Respiratory protection is necessary for spray application of the product (indoors and outdoors). EN 149: filter FFP2
6.2 Measures for consumer protection	Not relevant for this Exposure Scenario.

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6.3 Environmental protection measures

6.3.1 Air No relevant way of exposure.

6.3.2 Water Product is used for water treatment and is completely consumed in this application.
Product is completely consumed in this application.

6.3.3 Soil Product is used as part of agrochemicals.
Product is used for soil treatment.

6.4 Notes In case of unintended release of the product: See section 6 of the Safety Data Sheet.

7. Waste related measures

7.1 Disposal procedures Disposal according to official regulations
Waste code number according to origin of waste

7.2 Waste type Solid product residues
Aqueous solution

8. Exposure estimation

Worker (oral) No significant oral exposure

Worker (dermal) The highest dermal exposure to the substance to be expected is 0.0017 mg/kg/day (PROC 1, 3).
The highest dermal exposure for the substance to be expected is 0.0034 mg/kg/day (PROC 2, 5, 8b, 9)
The highest dermal exposure for the substance to be expected is 0.017 mg/kg/day (PROC 15)
The highest dermal exposure for the substance to be expected is 1.41 mg/kg/day (PROC 26)
The highest dermal exposure for the substance to be expected is 3.43 mg/kg/day (PROC 4)
The highest dermal exposure to the substance in solution to be expected is 3.43 mg/kg/day (PROC 7).
The exposure estimation was carried out in accordance with ECETOC TRA.

Worker (inhalation) No significant inhalative exposure

RCR (Risk Characterisation Ratio) Risk Characterisation Ratio RCR (total) <1 (0.0001 - 0.25), safe use can be assumed if risk management measures detailed in section 6 of the annex are observed.

Environment Since no PNECS were derived further assessment of the environmental exposure is not necessary.

Consumer Not relevant for this Exposure Scenario.

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FERROUS SULPHATE HEPTAHYDRATE (20)

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9. Guidance for downstream users

Whether the downstream user acts within the scope of the Exposure Scenario can be verified based on the information in sections 1 to 8.

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* **Annex: Exposure scenario 2**

1. Short title of the exposure scenario

ES 2: Professional use of FERROUS SULPHATE HEPTAHYDRATE (20)

2. Description of activities/ process(es) covered in the Exposure Scenario

Water treatment: treatment of waste water and WWTP sludge
Water treatment: Use in the treatment of raw water in the supply of potable water and/or industrial process water
H2S-Elimination in biogas and water treatment plants
Use in manufacture of cement (reduction of chromates)
Land remediation application
Use in agrochemicals
Use as laboratory reagent
Production of mixtures and solutions

Sector of Use

SU22 Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process category

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)
PROC11 Non industrial spraying
PROC15 Use as laboratory reagent
PROC19 Hand-mixing with intimate contact and only PPE available
PROC26 Handling of solid inorganic substances at ambient temperature

Environmental release category

ERC2 Formulation of preparations
ERC8a Wide dispersive indoor use of processing aids in open systems
ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8d Wide dispersive outdoor use of processing aids in open systems
ERC8e Wide dispersive outdoor use of reactive substances in open systems
ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix

3. Conditions of use

3.1 Duration and frequency

Worker

5 workdays/week.
Regular use with exposure up to 8 hours per workday.

Environment

Annual tonnage per site: up to 1000 t (Fe)

(Contd. on page 15)

(Contd. of page 14)

Typical amount per lot: 25 t (product)
Emission day per site: 365

4. Physical parameters
4.1 Physical state Solid
Fluid

4.2 Concentration of the substance in the mixture Raw material.
4.2 Concentration of substance in solution max. 500 g/l

5. Other operational conditions determining exposure 5.1 Other operational conditions affecting environmental exposure None

5.2 Other operational conditions affecting worker exposure None

5.3 Other operational conditions affecting consumer exposure Not relevant for this Exposure Scenario.

5.4 Other operational conditions affecting consumer exposure during the use of the product Not relevant for this Exposure Scenario.

6.1 Risk management measures
6.2 Worker protection
6.2.1 Organisational protective measures Handling procedures must be well documented.
Provide Internal Plant Instruction.
Ensure that activities are executed by specialists or authorised personnel only.

6.2.2 Technical protective measures No special precautions necessary if used correctly.
Ensure that suitable extractors are available on processing machines

6.2.3 Personal protective measures General measures corresponding to the standard of the chemical industry: see SDS section 8 .
Material of gloves and resistence:
Polychloroprene
Resistance to:
Sulphuric acid
Value for the permeation: Level ≥ 480 min (EN 374)
Respiratory protection is necessary for spray application of the product (indoors and outdoors).
EN 149: filter FFP2

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6.2 Measures for consumer protection Not relevant for this Exposure Scenario.

6.3 Environmental protection measures

6.3.1 Air No relevant way of exposure.

6.3.2 Water Product is used for water treatment and is completely consumed in this application.

6.3.3 Soil Product is used as part of agrochemicals.
Product is used for soil treatment.

6.4 Notes In case of unintended release of the product: See section 6 of the Safety Data Sheet.

7. Waste related measures

7.1 Disposal procedures Disposal according to official regulations
Waste code number according to origin of waste

7.2 Waste type Solid product residues
Aqueous solution

8. Exposure estimation

Worker (oral) No significant oral exposure

Worker (dermal) The highest dermal exposure for the substance to be expected is 0.0017 mg/kg/day (PROC 3)
The highest dermal exposure for the substance to be expected is 0.0034 mg/kg/day (PROC 2, 5, 8b, 9)
The highest dermal exposure to the substance to be expected is 0.017 mg/kg/day (PROC 15).
The highest dermal exposure for the substance to be expected is 1.41 mg/kg/day (PROC 26)
The highest dermal exposure for the substance to be expected is 3.43 mg/kg/day (PROC 4, 19)
The highest dermal exposure for the substance to be expected is 6.86 mg/kg/day (PROC 8a)
The highest dermal exposure to the substance in solution to be expected is 3.43 mg/kg/day (PROC 11).
The exposure estimation was carried out in accordance with ECETOC TRA.

Worker (inhalation) No significant inhalative exposure

RCR (Risk Characterisation Ratio) Risk Characterisation Ratio RCR (total) <1 (0.0001 - 0.49), safe use can be assumed if risk management measures detailed in section 6 of the annex are observed.

Environment Since no PNECS were derived further assessment of the environmental exposure is not necessary.

Consumer Not relevant for this Exposure Scenario.

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9. Guidance for downstream users

Whether the downstream user acts within the scope of the Exposure Scenario can be verified based on the information in sections 1 to 8.


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