

This safety data sheet was created pursuant to the requirements of:
UK REACH Regulations (SI 2019/758 as amended)

Supersedes date 05-Aug-2024

Revision date 11-Sep-2024

Revision Number 4.01

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

1.1. Product identifier

Product Code(s)	2312
Safety data sheet number	2312
Product Name	2-ETHYLHEXANOIC ACID
Index No	607-230-00-6
EC Number	205-743-6
CAS No	149-57-5
Synonyms	CAFLON CA-2EHA
Pure substance/mixture	Substance
Contains 2-ETHYLHEXANOIC ACID	
Molecular weight	144.21

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

Recommended use	Chemical intermediate Laboratory chemicals Functional fluids Restricted to professional users For further information, see attached Exposure Scenario
Uses advised against	Consumer use

1.3. Details of the supplier of the safety data sheet

Supplier

Univar Solutions UK Ltd
Aquarius House
6 Mid Point Business Park
Bradford
GBR

For further information, please contact

E-mail address	SDS.EMEA@univarsolutions.com
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306

1.4. Emergency telephone number

Emergency Telephone	SGS - +32 (0)3 575 55 55 (24h)
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SECTION 2: Hazards identification**2.1. Classification of the substance or mixture**

Reproductive toxicity	Category 1B - (H360D)
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2.2. Label elements

Contains 2-ETHYLHEXANOIC ACID



Signal word
Danger

Hazard statements
H360D - May damage the unborn child

Precautionary statements
P202 - Do not handle until all safety precautions have been read and understood
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P308 + P313 - IF exposed or concerned: Get medical advice/attention
P405 - Store locked up
P501 - Dispose of contents/ container to an approved waste disposal plant

Additional information
Restricted to professional users.

2.3. Other hazards

Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Pregnant women should not work with the product, if there is the least risk of exposure.

SECTION 3: Composition/information on ingredients**3.1 Substances**

Chemical name	Weight-%	EC No (EU Index No)	UK REACH registration number	Classification according to GB CLP (SI 2020/1567 as amended)	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)
2-ETHYLHEXANOIC ACID 149-57-5	90 - 100%	205-743-6	-	Repr. 1B (H360D)	-	-	-

Full text of H- and EUH-phrases: see section 16

This product does not contain candidate substances of very high concern at a concentration $\geq 0.1\%$ (UK REACH Article 59)

SECTION 4: First aid measures**4.1. Description of first aid measures**

General advice	Show this safety data sheet to the doctor in attendance.
Inhalation	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
Eye contact	Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a doctor.
Skin contact	Wash skin with soap and water. In the case of skin irritation or allergic reactions see a doctor.
Ingestion	Rinse mouth thoroughly with water. Do not induce vomiting without medical advice. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Get medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms	May damage the unborn child.
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4.3. Indication of any immediate medical attention and special treatment needed

Note to doctors	Treat symptomatically.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media	Dry chemical, CO2, alcohol-resistant foam or water spray.
Large Fire	CAUTION: Use of water spray when fighting fire may be inefficient.
Unsuitable extinguishing media	Do not scatter spilled material with high pressure water streams.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical	Vapors are heavier than air and may travel a long distance and accumulate in low lying areas.
Hazardous combustion products	Carbon oxides.

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Cool containers with flooding quantities of water until well after fire is out. Collect contaminated fire extinguishing water separately. Do not allow it to enter drains or surface water.
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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	Ensure adequate ventilation. Avoid contact with skin, eyes and inhalation of vapours. Keep people away from and upwind of spill/leak. Use personal protection recommended in Section 8.
For emergency responders	Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions	Do not allow runoff to sewer, waterway or ground.
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6.3. Methods and material for containment and cleaning up

Methods for containment	Prevent further leakage or spillage if safe to do so.
Methods for cleaning up	Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Take precautionary measures against static discharges.
Prevention of secondary hazards	Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections	See section 8 for more information. See section 13 for more information.
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SECTION 7: Handling and storage**7.1. Precautions for safe handling**

Advice on safe handling	Handle in accordance with good industrial hygiene and safety practice. Remove contaminated clothing and shoes. Pregnant women should not work with the product, if there is the least risk of exposure. Wear protective gloves/protective clothing and eye/face protection. Take precautionary measures against static discharge. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
General hygiene considerations	Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product. Remove contaminated clothing and protective equipment before entering eating areas. Take off all contaminated clothing and wash it before reuse. Ensure that eyewash stations and safety showers are close to the workstation location.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions	Store locked up. Store in a cool, dry, well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Keep away from food, drink and animal feedingstuffs. Avoid contact with: Bases. Strong oxidising agents. Amines. alkali.
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7.3. Specific end use(s)

Specific use(s)
See section 1 for more information.

Risk Management Methods (RMM)	The information required is contained in this Safety Data Sheet.
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SECTION 8: Exposure controls/personal protection**8.1. Control parameters**

Exposure Limits	This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.
Biological occupational exposure limits	This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

Derived No Effect Level (DNEL) - Workers

Chemical name	Oral	Dermal	Inhalation
2-ETHYLHEXANOIC ACID 149-57-5		2 mg/kg/day [4] [6]	14 mg/m ³ [4] [6]

[4] Systemic health effects.
[6] Long term.

Derived No Effect Level (DNEL) - General Public

Chemical name	Oral	Dermal	Inhalation
2-ETHYLHEXANOIC ACID 149-57-5	1 mg/kg/day [4] [6]	1 mg/kg/day [4] [6]	3.5 mg/m ³ [4] [6]

[4] Systemic health effects.
[6] Long term.

Predicted No Effect Concentration (PNEC)

Chemical name	Freshwater	Freshwater (intermittent release)	Marine water	Marine water (intermittent release)	Air
2-ETHYLHEXANOIC ACID 149-57-5	0.398 mg/l	1 mg/L	0.04 mg/l		

Chemical name	Freshwater sediment	Marine sediment	Sewage treatment	Soil	Food chain
2-ETHYLHEXANOIC ACID 149-57-5	4.74 mg/kg	0.474 mg/kg	71.7 mg/L	0.712 mg/kg	71.7 mg/l

8.2. Exposure controls**Engineering controls**

Ensure adequate ventilation. Handle product only in closed system or provide appropriate exhaust ventilation. Local and General Ventilation. Pregnant women should not work with the product, if there is the least risk of exposure. Use non sparking handtools and explosion-proof electric equipment. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protective equipment**Eye/face protection**

Tight sealing safety goggles. Use eye protection according to EN 166.

Hand protection

Wear suitable gloves. Gloves must conform to standard EN 374. Ensure that the breakthrough time of the glove material is not exceeded. Refer to glove supplier for information on breakthrough time for specific gloves.

Gloves			
Duration of contact	PPE - Glove material	Glove thickness	Break through time
Long term (repeated)	Nitrile rubber	0.55 mm	480 minutes
Long term (repeated)	Polyvinyl chloride (PVC)	0.8 mm	480 minutes
Long term (repeated)	Chloroprene rubber (CR)	0.55 mm	480 minutes

Skin and body protection

Wear suitable protective clothing.

Respiratory protection

In case of inadequate ventilation or when the product is heated, use suitable respiratory equipment with gas filter (type A2). EN 136/140/141/145/143/149.

General hygiene considerations

Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product. Remove contaminated clothing and protective equipment before entering eating areas. Take off all contaminated clothing and wash it before reuse. Ensure that eyewash stations and safety showers are close to the workstation location.

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Physical state	No information available
Appearance	Liquid
Colour	Colourless to pale yellow
Odour	Mild.
Odour threshold	No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Melting point / freezing point	< -59 °C	DIN ISO 3016.
Initial boiling point and boiling range	226 - 229 °C	OECD 103.
Flammability		No information available.
Flammability Limit in Air		No information available.
Upper flammability or explosive limits	6.7%	
Lower flammability or explosive limits	0.8%	
Flash point	~ 116 °C	Closed cup. DIN EN ISO 2719.
Autoignition temperature	> 300 - 335 °C	DIN 51794.
Decomposition temperature		No information available.
pH		No information available.
pH (as aqueous solution)	3 - 4	solution (0.1 %).
Kinematic viscosity	8.41 mm ² /s	@ 20 °C.
Dynamic viscosity		No information available.
Water solubility	Miscible with water 1.5 g/l @ 20 °C	OECD 105.
Solubility(ies)		No information available.
Partition coefficient	log Kow: 2.6	OECD 107.
Vapour pressure	0.004 kPa	@ 20 °C.
Relative density	0.91	20 °C.
Bulk density		No information available
Liquid Density	No information available	No information available
Relative vapour density	5	@ 20 °C.
Particle characteristics		No information available.
Particle Size	No information available	
Particle Size Distribution	No information available	
Explosive properties	Not considered to be explosive.	
Oxidising properties	Does not meet the criteria for classification as oxidising	

9.2. Other information

Molecular weight	144.21
Refractive Index	1.425 @ 20 C

SECTION 10: Stability and reactivity**10.1. Reactivity**

Reactivity	Exothermic reaction with alkalis.
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10.2. Chemical stability

Stability	Stable under normal conditions.
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Explosion data

Sensitivity to mechanical impact	None.
Sensitivity to static discharge	None.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	Hazardous polymerisation does not occur.
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10.4. Conditions to avoid

Conditions to avoid	Take precautionary measures against static discharges.
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10.5. Incompatible materials

Incompatible materials Bases. Amines. Strong oxidising agents. Alkali.

10.6. Hazardous decomposition products

Hazardous decomposition products None known based on information supplied.

SECTION 11: Toxicological information**11.1. Information on toxicological effects****Information on likely routes of exposure****Product Information**

Inhalation	Inhalation of vapours in high concentration may cause irritation of respiratory system.
Eye contact	May cause slight eye irritation.
Skin contact	May cause slight skin irritation.
Ingestion	May cause discomfort if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms May damage the unborn child.

Acute toxicity**Numerical measures of toxicity****Component Information**

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
2-ETHYLHEXANOIC ACID	= 2043 mg/kg (Rat)	> 2000 mg/kg (Rat)	-

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Based on available data the classification criteria are not met.

2-ETHYLHEXANOIC ACID (149-57-5)

Method	Species	Exposure route	Effective dose	Exposure time	Results
OECD 404	Rabbit	Dermal		4 hour	Mild skin irritant

Serious eye damage/eye irritation Based on available data the classification criteria are not met.

2-ETHYLHEXANOIC ACID (149-57-5)

Method	Species	Exposure route	Effective dose	Exposure time	Results
OECD 405	Rabbit	eye		24 hours	non-irritant

Respiratory or skin sensitisation Based on available data the classification criteria are not met.

2-ETHYLHEXANOIC ACID (149-57-5)

Method	Species	Exposure route	Results
OECD 406	Guinea pig	Dermal	Not a skin sensitiser

Germ cell mutagenicity Based on available data the classification criteria are not met.

Component Information

2-ETHYLHEXANOIC ACID (149-57-5)

Method	Species	Results
OECD 476	in vitro	Negative
OECD 471	in vitro	Negative
OECD 473	in vitro	Negative
OECD 474	Mouse	Negative

Carcinogenicity No information available.

Reproductive toxicity Contains a known or suspected reproductive toxin. May damage the unborn child.

The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as reproductive toxins.

Chemical name	United Kingdom
2-ETHYLHEXANOIC ACID	Repr. 2

2-ETHYLHEXANOIC ACID (149-57-5)

Method	Species	Results
EPA OTS 798.4900	Rabbit	NOAEL 25 mg/kg
EPA OTS 798.4900	Rat	NOAEL 100 mg/kg

STOT - single exposure No information available.

STOT - repeated exposure Based on available data the classification criteria are not met.

Component Information

2-ETHYLHEXANOIC ACID (149-57-5)

Method	Species	Exposure route	Effective dose	Exposure time	Results
EPA OTS 795.2600	Mouse	Oral		90 days	NOAEL 200 mg/kg bw/d
EPA OTS 795.2600	Rat	Oral		90 days	NOAEL mg/kg bw/d 300
OECD 407	Rat	Oral		15 days	NOAEL 200 mg/kg bw/d
OECD 407	Mouse	Oral		15 days	NOAEL 800 mg/kg bw/d

Aspiration hazard Based on available data the classification criteria are not met.

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

2-ETHYLHEXANOIC ACID (149-57-5)

Method	Species	Endpoint type	Effective dose	Exposure time	Results
OECD Test No. 211: Daphnia magna	Daphnia magna	NOEC		21 days	25 mg/l

Reproduction Test OECD Test No. 201: Freshwater Algae and Cyanobacteria, Growth Inhibition Test	Pseudokirchneriella subcapitata	NOEC		3 days	130 mg/l
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Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
2-ETHYLHEXANOIC ACID	EC50: =61mg/L (72h, Desmodesmus subspicatus) EC50: =41mg/L (96h, Desmodesmus subspicatus)	LC50: =70mg/L (96h, Pimephales promelas)	-	EC50: =85.4mg/L (48h, Daphnia magna)

12.2. Persistence and degradability

Persistence and degradability Readily biodegradable.

Method	Exposure time	Value	Results
OECD Test No. 301E: Ready Biodegradability: Modified OECD Screening Test (TG 301 E)	28 days	Biodegradation 99%	

2-ETHYLHEXANOIC ACID (149-57-5)

Method	Exposure time	Value	Results
OECD Test No. 301E: Ready Biodegradability: Modified OECD Screening Test (TG 301 E)	28 days	Biodegradation 99%	

12.3. Bioaccumulative potential

Bioaccumulation Not likely to bioaccumulate.

Component Information

Chemical name	Partition coefficient
2-ETHYLHEXANOIC ACID	2.7

12.4. Mobility in soil

Mobility in soil Koc <= 140.87.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment The product does not contain any substance(s) classified as PBT or vPvB.

Chemical name	PBT and vPvB assessment
2-ETHYLHEXANOIC ACID	The substance is not PBT / vPvB

12.6. Other adverse effects

No information available.

SECTION 13: Disposal considerations**13.1. Waste treatment methods**

Waste from residues/unused products Waste is classified as hazardous waste. Disposal to licensed waste disposal site in accordance with the local Waste Disposal Authority.

Contaminated packaging Do not reuse empty containers.

SECTION 14: Transport information**IATA**

14.1 UN number or ID number	Not regulated
14.2	
14.3 Transport hazard class(es)	Not regulated
14.4 Packing group	Not regulated
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	
Special Provisions	None

IMDG

14.1 UN number or ID number	Not regulated
14.3 Transport hazard class(es)	Not regulated
14.4 Packing group	Not regulated
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	
Special Provisions	None
14.7 Maritime transport in bulk according to IMO instruments	No information available

RID

14.1 UN number or ID number	Not regulated
14.2 UN proper shipping name	Not regulated
14.3 Transport hazard class(es)	Not regulated
14.4 Packing group	Not regulated
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	
Special Provisions	None

ADR

14.1 UN number or ID number	Not regulated
14.2 UN proper shipping name	Not regulated
14.3 Transport hazard class(es)	Not regulated
14.4 Packing group	Not regulated
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	
Special Provisions	None

SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****National regulations****Authorisations and/or restrictions on use:**

This product contains one or more substances subject to restriction (UK REACH - Annex XVII).

Product restricted per REACH Annex XVII: 3

Chemical name	Restricted substance per REACH Annex XVII	Substance subject to authorisation per REACH Annex XIV
2-ETHYLHEXANOIC ACID - 149-57-5	30	-

Persistent Organic Pollutants

Not applicable

Export Notification requirements

Not applicable

Named dangerous substances per COMAH Regulations 2015 (as amended)

Not applicable

The Ozone-Depleting Substances Regulations 2015

Not applicable

The Biocidal Products Regulations 2001 (as amended)

Not applicable

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended)

Not applicable

Poisons Act 1972 (Explosive Precursors) Regulations (as Amended)

Not applicable

International Inventories

TSCA	Contact supplier for inventory compliance status
DSL/NDL	Contact supplier for inventory compliance status
EINECS/ELINCS	Contact supplier for inventory compliance status
ENCS	Contact supplier for inventory compliance status
IECSC	Contact supplier for inventory compliance status
KECI	Contact supplier for inventory compliance status
PICCS	Contact supplier for inventory compliance status
AIIC	Contact supplier for inventory compliance status
NZIoC	Contact supplier for inventory compliance status

Legend:

TSCA	- United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDL	- Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS	- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS	- Japan Existing and New Chemical Substances
IECSC	- China Inventory of Existing Chemical Substances
KECL	- Korean Existing and Evaluated Chemical Substances
PICCS	- Philippines Inventory of Chemicals and Chemical Substances
AIIC	- Australian Inventory of Industrial Chemicals
NZIoC	- New Zealand Inventory of Chemicals

15.2. Chemical safety assessment

Chemical Safety Report No information available

SECTION 16: Other information**Key or legend to abbreviations and acronyms used in the safety data sheet****Full text of H-Statements referred to under section 3**

H360D - May damage the unborn child

Legend

SVHC: Substances of Very High Concern for Authorisation:

Legend Section 8: Exposure controls/personal protection

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation
+	Sensitisers		
Revision Note SDS sections updated 1 16			

Classification procedure

Classification according to Regulation (EC) No. 1272/2008 [CLP]	Method Used
Acute oral toxicity	Calculation method
Acute dermal toxicity	Calculation method
Acute inhalation toxicity - gas	Calculation method
Acute inhalation toxicity - vapour	Calculation method
Acute inhalation toxicity - dust/mist	Calculation method
Skin corrosion/irritation	Calculation method
Serious eye damage/eye irritation	Calculation method
Respiratory sensitisation	Calculation method
Skin sensitisation	Calculation method

Mutagenicity	Calculation method
Carcinogenicity	Calculation method
STOT - single exposure	Calculation method
STOT - repeated exposure	Calculation method
Acute aquatic toxicity	Calculation method
Chronic aquatic toxicity	Calculation method
Aspiration hazard	Calculation method
Ozone	Calculation method

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
European Chemicals Agency (ECHA) Committee for Risk Assessment (ECHA_RAC)
European Chemicals Agency (ECHA) (ECHA_API)
Environmental Protection Agency
Acute Exposure Guideline Level(s) (AEGL(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
National Institute of Technology and Evaluation (NITE)
Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine's PubMed database (NLM PUBMED)
U.S. National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organisation for Economic Co-operation and Development Environment, Health, and Safety Publications
Organisation for Economic Co-operation and Development High Production Volume Chemicals Programme
Organisation for Economic Co-operation and Development Screening Information Data Set
World Health Organization

Prepared By J Spenceley

Supersedes date 05-Aug-2024

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This material safety data sheet complies with the requirements of UK REACH Regulations (SI 2019/758 as amended)
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The 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, unless specified in the text.

End of Safety Data Sheet

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 2-Ethylhexanoic Acid
REACH registration number 01-2119488942-23-XXXX
CAS No 149-57-5
EC No (EU Index No) 205-743-6
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Industrial use resulting in manufacture of another substance (use of intermediates)
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Process category(ies) 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

Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU9
 - Manufacture of fine chemicals SU17 - General manufacturing

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Covers concentrations up to 100%
Amounts used

Type	Daily amount per site
Value	50000
Units	kg/d

Type	Annual amount per site
Value	5000
Units	t(ons)/year

Other operational conditions of use affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.1%
Release fraction to wastewater from process (initial release prior to RMM)	0.1%
Release fraction to soil from process (initial release prior to RMM)	0.1%

Operational conditions

Other	Assumes use at not more than 20°C above ambient temperature, unless stated differently
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment	2000
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plant flow	
Removal efficiency (total)	87.5%

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
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Conditions and measures related to external recovery of waste

Method	External recovery and recycling of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Physical form of product	Liquid
Use frequency	Covers use up to 4 hours
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity

personal protection, hygiene and health evaluation	training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Predicted No Effect Concentration (PNEC)

Impact on Sewage Treatment 72 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.312 mg/l	0.867
Freshwater sediment	5.52 mg/kg dw	0.867
Marine water	0.031 mg/l	0.867
Marine sediment	0.552 mg/kg dw	0.867
Soil	0.968 mg/kg dw	0.913
STP: Sewage Treatment Plant	3.121 mg/l	0.044

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2 mg/kg bw/day
Worker - inhalative, long-term - systemic	14 mg/m ³
Consumer - oral, long-term - systemic	1 mg/kg bw/day
Consumer - dermal, long-term - systemic	1 mg/kg bw/day
Consumer - inhalative, long-term - systemic	3.5 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.06 mg/m ³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg b.w./d	0.021
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	6.009 mg/m ³	0.429
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg b.w./d	0.137
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	12.62 mg/m ³	0.901
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg b.w./d	0.069
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	5.408 mg/m ³	0.386
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at	Worker - dermal, long-term - systemic	0.685 mg/kg b.w./d	0.343

dedicated facilities			
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Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

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REACH registration number 01-2119488942-23-XXXX
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Supplier Univar Solutions UK Ltd
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Section 1 - Title

Title Formulation & (re)packing of substances and mixtures
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC2 - Formulation of preparations (mixtures)
Process category(ies) 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 (multi-stage 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)

Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys)

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Covers concentrations up to 100%
Amounts used

Type	Daily amount per site
Value	4500
Units	kg/d

Type	Annual amount per site
Value	1000
Units	t(ons)/year

Other operational conditions of use affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0%
Release fraction to wastewater from process (initial release prior to RMM)	0.5%
Release fraction to soil from process (initial release prior to RMM)	0%

Operational conditions

Other	Assumes use at not more than 20°C above ambient temperature, unless stated differently
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	2000
Removal efficiency (total)	87.5%

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
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Conditions and measures related to external recovery of waste

Method	External recovery and recycling of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC3 - Use in closed batch process (synthesis or formulation)
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Physical form of product	Liquid

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Physical form of product	Liquid
Use frequency	Avoid carrying out activities involving exposure for more than 1 hour
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Predicted No Effect Concentration (PNEC)

Impact on Sewage Treatment 72 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.142 mg/l	0.394
Freshwater sediment	2.512 mg/kg dw	0.394
Marine water	0.014 mg/l	0.395
Marine sediment	0.251 mg/kg dw	0.394
Soil	0.44 mg/kg dw	0.415
STP: Sewage Treatment Plant	1.42 mg/l	0.02

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2 mg/kg bw/day
Worker - inhalative, long-term - systemic	14 mg/m ³
Consumer - oral, long-term - systemic	1 mg/kg bw/day
Consumer - dermal, long-term - systemic	1 mg/kg bw/day
Consumer - inhalative, long-term - systemic	3.5 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.06 mg/m ³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg b.w./d	0.017
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	6.009 mg/m ³	0.429
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg b.w./d	0.137
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	12.62 mg/m ³	0.901
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.138 mg/kg b.w./d	0.069
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	9.013 mg/m ³	0.644
PROC4 - Use in batch and other	Worker - dermal, long-term -	0.343 mg/kg b.w./d	0.172

process (synthesis) where opportunity for exposure arises	systemic		
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - systemic	9.013 mg/m ³	0.644
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - dermal, long-term - systemic	0.685 mg/kg b.w./d	0.343
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	3.605 mg/m ³	0.685
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.685 mg/kg b.w./d	0.343
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - systemic	9.013 mg/m ³	0.644
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.685 mg/kg b.w./d	0.343
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	0.644 mg/m ³	0.644
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.343 mg/kg b.w./d	0.343

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 2-Ethylhexanoic Acid
REACH registration number 01-2119488942-23-XXXX
CAS No 149-57-5
EC No (EU Index No) 205-743-6
Supplier Univar Solutions UK Ltd
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 6 Mid Point Business Park
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Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

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Section 1 - Title

Title Laboratory activities
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies) PROC15 - Use as laboratory reagent
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU24 - Scientific research and development

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Covers concentrations up to 100%
Amounts used

Type	Daily amount per site
Value	10
Units	kg/d

Type	Annual amount per site
Value	5
Units	t(ons)/year

Other operational conditions of use affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	1%
Release fraction to wastewater from process (initial release prior to RMM)	0.5%
Release fraction to soil from process (initial release prior to RMM)	0.1%

Operational conditions

Other	Assumes use at not more than 20°C above ambient temperature, unless stated differently
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	2000
Removal efficiency (total)	87.52%

Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
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Conditions and measures related to external recovery of waste

Method	External recovery and recycling of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC15 - Use as laboratory reagent
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC)

Impact on Sewage Treatment 72 mg/l

Calculation method Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.062 mg/l	0.174
Freshwater sediment	1.105 mg/kg dw	0.173
Marine water	6.25E-3 mg/l	0.174
Marine sediment	0.111 mg/kg dw	0.173
Soil	0.194 mg/kg dw	0.183
STP: Sewage Treatment Plant	0.624 mg/l	<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2 mg/kg bw/day
Worker - inhalative, long-term - systemic	14 mg/m ³
Consumer - oral, long-term - systemic	1 mg/kg bw/day
Consumer - dermal, long-term - systemic	1 mg/kg bw/day
Consumer - inhalative, long-term - systemic	3.5 mg/m ³

Calculation method Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	3.004 mg/m ³	0.215
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.34 mg/kg b.w./d	0.17

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

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Section 1 - Title

Title Laboratory activities
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8a - Wide dispersive indoor use of processing aids in open systems
Process category(ies) PROC15 - Use as laboratory reagent
Sector(s) of use SU24 - Scientific research and development SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems

Covers concentrations up to 100%
Amounts used

Type	Daily amount for wide dispersive uses
Value	0.0027
Units	kg/d

Other operational conditions of use affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	100%
Release fraction to wastewater from process (initial release prior to RMM)	100%
Release fraction to soil from process (initial release prior to RMM)	0%

Operational conditions

Other	Assumes use at not more than 20°C above ambient temperature, unless stated differently
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	2000
Removal efficiency (total)	87.5%

Further information

Operational conditions	Indoor use
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Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
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Conditions and measures related to external recovery of waste

Method	External recovery and recycling of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC15 - Use as laboratory reagent
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Local exhaust ventilation - efficiency of at least 80%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems

Predicted No Effect Concentration (PNEC)

Impact on Sewage Treatment 72 mg/l

Calculation method

Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	7.76E-5 mg/l	<0.01
Freshwater sediment	1.37E-3 mg/kg dw	<0.01
Marine water	7.32E-6 mg/l	<0.01
Marine sediment	1.29E-4 mg/kg dw	<0.01
Soil	6.1E-5 mg/kg dw	<0.01
STP: Sewage Treatment Plant	1.72E-4 mg/l	<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2 mg/kg bw/day
Worker - inhalative, long-term - systemic	14 mg/m ³
Consumer - oral, long-term - systemic	1 mg/kg bw/day
Consumer - dermal, long-term - systemic	1 mg/kg bw/day
Consumer - inhalative, long-term - systemic	3.5 mg/m ³

Calculation method

Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - systemic	6.009 mg/m ³	0.329
PROC15 - Use as laboratory reagent	Worker - dermal, long-term - systemic	0.34 mg/kg b.w./d	0.17

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

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Section 1 - Title

Title Functional fluids
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC7 - Industrial use of substances in closed systems
Process category(ies) 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
 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)
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC7 - Industrial use of substances in closed systems

Covers concentrations up to 100%

Amounts used

Type	Daily amount per site
Value	3000
Units	kg/d

Type	Annual amount per site
Value	300
Units	t(ons)/year

Other operational conditions of use affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	1%
Release fraction to wastewater from process (initial release prior to RMM)	1%
Release fraction to soil from process (initial release prior to RMM)	1%

Operational conditions

Other	Assumes use at not more than 20°C above ambient temperature, unless stated differently
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	2000
Removal efficiency (total)	87.5%

Further information

Operational conditions	Indoor/Outdoor use
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Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
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Conditions and measures related to external recovery of waste

Method	External recovery and recycling of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC3 - Use in closed batch process (synthesis or formulation)
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC7 - Industrial use of substances in closed systems

Predicted No Effect Concentration (PNEC)

Impact on Sewage Treatment 72 mg/l

Calculation method

Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.187 mg/l	0.52
Freshwater sediment	3.312 mg/kg dw	0.52
Marine water	0.019 mg/l	0.52
Marine sediment	0.331 mg/kg dw	0.52
Soil	0.581 mg/kg dw	0.548
STP: Sewage Treatment Plant	1.873 mg/l	0.026

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2 mg/kg bw/day
Worker - inhalative, long-term - systemic	14 mg/m ³
Consumer - oral, long-term - systemic	1 mg/kg bw/day
Consumer - dermal, long-term - systemic	1 mg/kg bw/day
Consumer - inhalative, long-term - systemic	3.5 mg/m ³

Calculation method

Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.06 mg/m ³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg b.w./d	0.017
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	6.009 mg/m ³	0.429
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.274 mg/kg b.w./d	0.137
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	12.62 mg/m ³	0.901
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.069 mg/kg b.w./d	0.035
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - systemic	9.013 mg/m ³	0.644
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - dermal, long-term - systemic	0.343 mg/kg b.w./d	0.172
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	10.82 mg/m ³	0.773
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.411 mg/kg b.w./d	0.206
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at	Worker - inhalative, long-term - systemic	5.408 mg/m ³	0.386

dedicated facilities			
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - dermal, long-term - systemic	0.411 mg/kg b.w./d	0.206
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	5.408 mg/m ³	0.386
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.412 mg/kg b.w./d	0.206

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name 2-Ethylhexanoic Acid
REACH registration number 01-2119488942-23-XXXX
CAS No 149-57-5
EC No (EU Index No) 205-743-6
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Functional fluids
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC9a - Wide dispersive indoor use of substances in closed systems ERC9b - Wide dispersive outdoor use of substances in closed systems
Process category(ies) 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)
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Sector(s) of use SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC9a - Wide dispersive indoor use of substances in closed systems
 - ERC9b - Wide dispersive outdoor use of substances in closed systems

Covers concentrations up to 100%
Amounts used

Type	Daily amount for wide dispersive uses
Value	0.11
Units	kg/d

Type	Fraction of EU tonnage used in region
Value	0.1

Other operational conditions of use affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.5%
Release fraction to wastewater from process (initial release prior to RMM)	0.5%

Release fraction to soil from process (initial release prior to RMM)	0.5%
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Operational conditions

Other	Assumes use at not more than 20°C above ambient temperature, unless stated differently
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Conditions and measures related to municipal sewage treatment plant

Assumed domestic sewage treatment plant flow	2000
Removal efficiency (total)	87.5%

Further information

Operational conditions	Indoor use
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Environmental factors not influenced by risk management

Receiving water dilution (fresh or marine)	18000 m3/d
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Conditions and measures related to external recovery of waste

Method	External recovery and recycling of waste should comply with applicable local and/or national regulations
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Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC3 - Use in closed batch process (synthesis or formulation)
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	25%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN 374
Organisational measures to prevent	Assumes a good basic standard of occupational hygiene is implemented

/limit releases, dispersion and exposure	
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Avoid carrying out activities involving exposure for more than 1 hour
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of controlled ventilation (5 to 10 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Covers concentrations up to	25%
Physical form of product	Liquid
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training
Organisational measures to prevent /limit releases, dispersion and exposure	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC9a - Wide dispersive indoor use of substances in closed systems
- ERC9b - Wide dispersive outdoor use of substances in closed systems

**Predicted No Effect Concentration
(PNEC)**

Impact on Sewage Treatment 72 mg/l

Calculation method

Used CHESAR model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	9.47E-5 mg/l	<0.01
Freshwater sediment	1.68E-3 mg/kg dw	<0.01
Marine water	9.04E-6 mg/l	<0.01
Marine sediment	1.6E-4 mg/kg dw	<0.01
Soil	1.14E-4 mg/kg dw	<0.01
STP: Sewage Treatment Plant	3.43E-4 mg/l	<0.01

Derived No Effect Level (DNEL):

Worker - dermal, long-term - systemic	2 mg/kg bw/day
Worker - inhalative, long-term - systemic	14 mg/m ³
Consumer - oral, long-term - systemic	1 mg/kg bw/day
Consumer - dermal, long-term - systemic	1 mg/kg bw/day
Consumer - inhalative, long-term - systemic	3.5 mg/m ³

Calculation method

Used CHESAR model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - systemic	0.06 mg/m ³	<0.01
PROC1 - Use in closed process, no likelihood of exposure	Worker - dermal, long-term - systemic	0.034 mg/kg b.w./d	0.017
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - systemic	12.62 mg/m ³	0.901
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - dermal, long-term - systemic	0.082 mg/kg b.w./d	0.041
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - systemic	10.82 mg/m ³	0.773
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - dermal, long-term - systemic	0.083 mg/kg b.w./d	0.041
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - systemic	5.408 mg/m ³	0.386
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - dermal, long-term - systemic	0.823 mg/kg b.w./d	0.411
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - systemic	10.82 mg/m ³	0.773
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - dermal, long-term - systemic	0.412 mg/kg b.w./d	0.206
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - inhalative, long-term - systemic	12.62 mg/m ³	0.901
PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems	Worker - dermal, long-term - systemic	0.103 mg/kg b.w./d	0.051

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.