

Biphenyl, Flake

Version 1.1 PRD Revision Date: 08/05/2019 SDS Number: 150000093414 Date of last issue: -
SDSUS / Z8 / 0001 Date of first issue: 09/06/2016

SECTION 1. IDENTIFICATION

Product name : Biphenyl, Flake
Product code : 34107-00, P3410704, P3410702, E3410701

Manufacturer or supplier's details

Company name of supplier : Eastman Chemical Company
Address : 200 South Wilcox Drive
Kingsport TN 37660-5280
Telephone : (423) 229-2000
Emergency telephone : CHEMTREC: +1-800-424-9300, +1-703-527-3887 CCN7321

Recommended use of the chemical and restrictions on use


Recommended use : Chemical intermediate
Heat transfer fluids
Restrictions on use : None known.

SECTION 2. HAZARDS IDENTIFICATION**GHS classification in accordance with 29 CFR 1910.1200**

Combustible dust

Skin irritation : Category 2
Eye irritation : Category 2A
Specific target organ systemic toxicity - single exposure : Category 3 (Respiratory system)

GHS label elements

Hazard pictograms : 

Signal Word : Warning

Hazard Statements : H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
If converted to small particles during further processing, handling or by other means may form combustible dust

Biphenyl, Flake

Version 1.1 PRD Revision Date: 08/05/2019 SDS Number: 150000093414 Date of last issue: -
SDSUS / Z8 / 0001 Date of first issue: 09/06/2016

concentrations in air.

Precautionary Statements

:

Prevention:

P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ eye protection/ face protection.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Components

Chemical name	CAS-No.	Concentration (% w/w)
Biphenyl; diphenyl	92-52-4	100

SECTION 4. FIRST AID MEASURES

If inhaled : Remove person to fresh air and keep comfortable for breathing.
If breathing is difficult, give oxygen.
Consult a physician if necessary.

In case of skin contact : Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.
If skin irritation occurs: Get medical advice/ attention.

Biphenyl, Flake

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	08/05/2019	15000093414	Date of first issue: 09/06/2016
PRD		SDSUS / Z8 / 0001	

Wash contaminated clothing before reuse.

In case of eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.
Get medical attention if symptoms occur.

If swallowed : Rinse mouth.
Never give anything by mouth to an unconscious person.
Get medical advice/ attention.
If swallowed, DO NOT induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed : Causes skin irritation.
Causes serious eye irritation.
May cause respiratory irritation.
The molten product can cause serious burns.

Notes to physician : Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Water spray
Carbon dioxide (CO₂)
Dry chemical
Foam

Unsuitable extinguishing media : Do not use a solid water stream as it may scatter and spread fire.

Hazardous combustion products : Hazardous decomposition products due to incomplete combustion
Carbon oxides

Further information : Use a water spray to cool fully closed containers.
Do not allow run-off from fire fighting to enter drains or water courses.

Special protective equipment for fire-fighters : Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Ventilate the area.
Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
Avoid contact with skin and eyes.
Wash skin thoroughly after handling.
Wear appropriate personal protective equipment.
Local authorities should be advised if significant spillages cannot be contained.

Environmental precautions : Clear up spills immediately and dispose of waste safely.
Avoid release to the environment.

Biphenyl, Flake

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	08/05/2019	15000093414	Date of first issue: 09/06/2016
PRD		SDSUS / Z8 / 0001	

Collect spillage.

Methods and materials for containment and cleaning up : Sweep up and shovel into suitable containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling : Do not breathe vapors or spray mist.
 Handle product only in closed system or provide appropriate exhaust ventilation at machinery.
 In case of insufficient ventilation, wear suitable respiratory equipment.
 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
 Wear appropriate personal protective equipment.
 Avoid contact with skin, eyes and clothing.
 Wash thoroughly after handling.
 Wash contaminated clothing before reuse.
 Drain or remove substance from equipment prior to break-in or maintenance.
 Handle in accordance with good industrial hygiene and safety practice.
 Minimize dust generation and accumulation.

Conditions for safe storage : Store locked up.
 Keep container tightly closed in a dry and well-ventilated place.
 Keep in a cool place away from oxidizing agents.

Materials to avoid : Keep container tightly closed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Ingredients with workplace control parameters**

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Biphenyl; diphenyl	92-52-4	TWA	0.2 ppm	ACGIH
		TWA	0.2 ppm 1 mg/m ³	NIOSH REL
		TWA	0.2 ppm 1 mg/m ³	OSHA Z-1
		TWA	0.2 ppm 1 mg/m ³	OSHA P0

Engineering measures : Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne

Biphenyl, Flake

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	08/05/2019	150000093414	Date of first issue: 09/06/2016
PRD		SDSUS / Z8 / 0001	

levels to an acceptable level.

Personal protective equipment

Respiratory protection : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary.
Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable.
If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.

Hand protection

Remarks : Wear suitable gloves. When handling hot material, use heat resistant gloves.

Eye protection : Wear safety glasses with side shields (or goggles).

Skin and body protection : Wear suitable protective clothing.

Protective measures : Ensure that eye flushing systems and safety showers are located close to the working place.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : flakes

Color : white

Odor : aromatic

Odor Threshold : not determined

pH : not determined

Melting point/range : 156 °F / 69 °C
(1,013 hPa)

Boiling point/boiling range : 491 °F / 255 °C
(1,013 hPa)

Flash point : 235 °F / 113 °C

Method: Cleveland open cup

Evaporation rate : not determined

Flammability (solid, gas) : May form combustible dust concentrations in air during proce-

Biphenyl, Flake

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	08/05/2019	150000093414	Date of first issue: 09/06/2016
PRD		SDSUS / Z8 / 0001	

ssing, handling or other means.

Self-ignition : 1004 °F / 540 °C
Method: ASTM E659

Upper explosion limit / Upper flammability limit : 5.6 %(V)

Lower explosion limit / Lower flammability limit : 0.6 %(V)

Vapor pressure : 1.19 Pa (77 °F / 25 °C)

Relative vapor density : not determined

Relative density : 1.04 (68 °F / 20 °C)

Solubility(ies)
Water solubility : 7.35 mg/l (77 °F / 25 °C)

Autoignition temperature : not determined

Decomposition temperature : not determined

Viscosity
Viscosity, dynamic : not determined

Viscosity, kinematic : 0.98 mm²/s (212 °F / 100 °C)
0.43 mm²/s (392 °F / 200 °C)
0.24 mm²/s (572 °F / 300 °C)

Explosive properties : Not classified

Oxidizing properties : Not classified

Dust deflagration index (Kst) : 221 m.b./s

Minimum ignition energy : 3 - 10 mJ

SECTION 10. STABILITY AND REACTIVITY

Reactivity : None reasonably foreseeable.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : None known.

Conditions to avoid : Heating in air.
Heat, flames and sparks.

Biphenyl, Flake

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	08/05/2019	150000093414	Date of first issue: 09/06/2016
PRD		SDSUS / Z8 / 0001	

Incompatible materials	:	Strong oxidizing agents
Hazardous decomposition products	:	Emits acrid smoke and fumes when heated to decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION**Acute toxicity****Product:**

Acute oral toxicity	:	LD50 Oral (Rat, male): > 2,180 mg/kg Assessment: The component/mixture is minimally toxic after single ingestion.
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 3.47 mg/l Exposure time: 1 h Assessment: The substance or mixture has no acute inhalation toxicity

Skin corrosion/irritation**Product:**

Species	:	Rabbit
Result	:	slight
Species	:	Humans
Assessment	:	Irritating to skin.
Result	:	strong

Serious eye damage/eye irritation**Product:**

Species	:	Rabbit
Result	:	slight irritation
Species	:	Humans
Result	:	strong
Assessment	:	Irritating to eyes.

Respiratory or skin sensitization**Product:**

Test Type	:	OECD 406: Guinea pig sensitization
Species	:	Guinea pig
Assessment	:	Not classified
Result	:	Does not cause skin sensitization.

Germ cell mutagenicity**Product:**

Genotoxicity in vitro	:	Test Type: Salmonella typhimurium assay (Ames test)
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Biphenyl, Flake

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	08/05/2019	15000093414	Date of first issue: 09/06/2016
PRD		SDSUS / Z8 / 0001	

Metabolic activation: +/- activation
 Method: Bacterial Reverse Mutation Assay
 Result: negative

Test Type: Mutagenicity - Mammalian
 Metabolic activation: + activation
 Method: In vitro Mammalian Cell Gene Mutation Test
 Result: positive

Test Type: Chromosome aberration test in vitro
 Metabolic activation: +/- activation
 Method: In vitro Mammalian Chromosome Aberration Test
 Result: negative

Test Type: Mutagenicity - Mammalian
 Method: OECD Guideline 482
 Result: negative

Genotoxicity in vivo : Species: Mouse (Male and Female)
 Method: Mammalian Erythrocyte Micronucleus Test
 Result: negative

Species: Rat (male)
 Method: Mammalian Bone Marrow Chromosome Aberration Test
 Result: negative

Carcinogenicity**Product:**

Species : Rat, male and female
 Application Route : Ingestion
 Method : OECD Test No. 453: Combined Chronic Toxicity/Carcinogenicity Studies
 Remarks : Expert judgment
 Not classified

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity**Product:**

Reproductive toxicity - Assessment : Based on available data the classification criteria are not met.
 Not classified as hazardous.

Biphenyl, Flake

Version Revision Date: SDS Number: Date of last issue: -
1.1 08/05/2019 150000093414 Date of first issue: 09/06/2016
PRD

STOT-single exposure**Product:**

Routes of exposure : Inhalation
Target Organs : Respiratory system
Assessment : The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

STOT-repeated exposure**Product:**

Target Organs : Kidney, Liver, Urinary bladder
Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity**Product:**

Species : Rat, male and female
NOAEL : 39 mg/kg
Application Route : in feed
Exposure time : 2 year
Method : OECD Test No. 453: Combined Chronic Toxicity/Carcinogenicity Studies
Target Organs : Blood, Kidney, Liver

Species : Rabbit
NOAEL : > 2,000 mg/kg
Application Route : Dermal
Exposure time : 28 days
Remarks : No significant adverse effects were reported

Aspiration toxicity**Product:**

Not applicable

Information on likely routes of exposure**Product:**

Inhalation : Remarks: May cause respiratory irritation.
Skin contact : Remarks: Causes skin irritation.
Eye contact : Remarks: Causes serious eye irritation.
Ingestion : Remarks: May be harmful if swallowed.

Biphenyl, Flake

Version 1.1 PRD Revision Date: 08/05/2019 SDS Number: 15000093414 Date of last issue: -
SDSUS / Z8 / 0001 Date of first issue: 09/06/2016

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity****Product:**

- Toxicity to fish : EC50 (Pimephales promelas (fathead minnow)): 3 mg/l
Exposure time: 96 h
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.36 mg/l
Exposure time: 48 h
- Toxicity to algae/aquatic plants : EC50 (Chlorella pyrenoidosa): 1.3 mg/l
Exposure time: 72 h
- NOEC (Chlorella pyrenoidosa): 0.66 mg/l
Exposure time: 72 h
- M-Factor (Acute aquatic toxicity) : 1
- Toxicity to fish (Chronic toxicity) : NOEC (Oncorhynchus mykiss (rainbow trout)): 0.229 mg/l
Exposure time: 96 d
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.17 mg/l
Exposure time: 21 d
- M-Factor (Chronic aquatic toxicity) : 1

Persistence and degradability**Product:**

- Biodegradability : Result: Readily biodegradable.
Method: Ready Biodegradability: Modified MITI Test (I)

Bioaccumulative potential**Product:**

- Bioaccumulation : Bioconcentration factor (BCF): 1,900

Mobility in soil**Product:**

- Distribution among environmental compartments : Medium: Soil
Koc: 1546, log Koc: 3.19
Method: OECD Test No. 106: Adsorption - Desorption Using a Batch Equilibrium Method

Other adverse effects

No data available

Biphenyl, Flake

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	08/05/2019	150000093414	Date of first issue: 09/06/2016
PRD		SDSUS / Z8 / 0001	

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : Dispose of in accordance with local regulations.

This material when discarded may be a hazardous waste as that term is defined by the Resource Conservation and Recovery Act (RCRA), 40 CFR 261.24, due to its toxicity characteristic. This material should be analyzed in accordance with Method 1311 for the compound D018 BENZENE.

Consult 40 CFR 268.40 or appropriate local regulations for concentration based standards.

SECTION 14. TRANSPORT INFORMATION**International Regulations****IATA-DGR**

UN/ID No. : UN 3077
Proper shipping name : Environmentally hazardous substance, solid, n.o.s. (biphenyl)
Class : 9
Packing group : III
Labels : Miscellaneous
Packing instruction (cargo aircraft) : 956
Packing instruction (passenger aircraft) : 956

IMDG-Code

UN number : UN 3077
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (biphenyl, diphenyl)
Class : 9
Packing group : III
Labels : 9
EmS Code : F-A, S-F
Marine pollutant : yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation**49 CFR**

UN/ID/NA number : UN 3077
Proper shipping name : Environmentally hazardous substance, solid, n.o.s. (biphenyl)
Class : 9
Packing group : III
Labels : Class 9 - Miscellaneous Dangerous Goods

Biphenyl, Flake

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	08/05/2019	15000093414	Date of first issue: 09/06/2016
PRD		SDSUS / Z8 / 0001	

ERG Code : 171
 Marine pollutant : yes(diphenyl)
 Remarks : Shipping in package sizes of less than 5 L (liquids) or 5 KG (solids) may lead to a non-regulated classification.

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION**EPCRA - Emergency Planning and Community Right-to-Know****CERCLA Reportable Quantity**

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Biphenyl; diphenyl	92-52-4	100	100

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Combustible dust
 Skin corrosion or irritation
 Serious eye damage or eye irritation
 Specific target organ toxicity (single or repeated exposure)

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Biphenyl; diphe- 92-52-4
 nyl

California Prop. 65

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

The ingredients of this product are reported in the following inventories:

DSL : All components of this product are on the Canadian DSL
 AICS : On the inventory, or in compliance with the inventory
 ENCS : On the inventory, or in compliance with the inventory
 ISHL : On the inventory, or in compliance with the inventory
 KECI : On the inventory, or in compliance with the inventory
 PICCS : On the inventory, or in compliance with the inventory

Biphenyl, Flake

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	08/05/2019	150000093414	Date of first issue: 09/06/2016
PRD		SDSUS / Z8 / 0001	

IECSC : On the inventory, or in compliance with the inventory

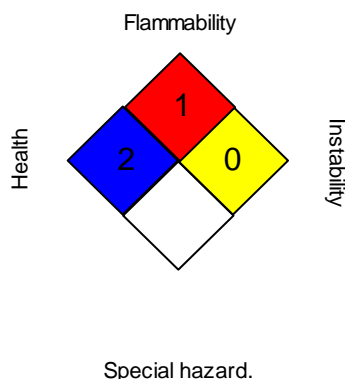
TCSI : On the inventory, or in compliance with the inventory

TSCA : All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION**Further information****NFPA 704:****HMIS® IV:**

HEALTH	/	2
FLAMMABILITY		1
PHYSICAL HAZARD		0

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)

NIOSH REL : USA. NIOSH Recommended Exposure Limits

OSHA P0 : USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

OSHA Z-1 : USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants

ACGIH / TWA : 8-hour, time-weighted average

NIOSH REL / TWA : Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek

OSHA P0 / TWA : 8-hour time weighted average

OSHA Z-1 / TWA : 8-hour time weighted average

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Sub-

Biphenyl, Flake

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	08/05/2019	150000093414	Date of first issue: 09/06/2016
PRD		SDSUS / Z8 / 0001	

stances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to : www.processfluid.com
compile the Material Safety
Data Sheet

Revision Date : 08/05/2019

The information provided in this Material 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.

US / Z8