Eastman(TM) Chlorinated Polyolefin 153-2 (25% Solids in Xylene)

Version	Revision Date:	SDS Number:	Date of last issue: 07/11/2019
2.3	02/12/2020	150000000047	Date of first issue: 09/06/2016
PRD		SDSUS / Z8 / 0001	

SECTION 1. IDENTIFICATION

Product name : Eastman(TM) Chlorinated Polyolefin 153-2 (25% Solids in Xylene)

Product code : 06357-00, P0635704, S0635703, S0635704, S0635707

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 : Adhesion promoter

Restrictions on use : None known.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Flammable liquids : Category 3

Acute toxicity (Inhalation) : Category 4

Acute toxicity (Dermal) : Category 4

Skin irritation : Category 2

Eye irritation : Category 2A

Specific target organ toxicity - single exposure : Category 3 (Respiratory system)

Specific target organ toxicity - repeated exposure : Category 2 (hearing organs)

GHS label elements

Hazard pictograms :

Signal Word : Warning

Hazard Statements : H226 Flammable liquid and vapor.
H312 + H332 Harmful in contact with skin or if inhaled.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H373 May cause damage to organs (hearing organs) through prolonged or repeated exposure.

Precautionary Statements :

Prevention:

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe 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:

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
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.
P314 Get medical advice/ attention if you feel unwell.
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.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.
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

Components

Chemical name	CAS-No.	Concentration (% w/w)
xylene	1330-20-7	49.2 - 75
chlorinated polyolefin	proprietary	> 10
ethylbenzene	100-41-4	0 - 18.8
chlorobenzene	108-90-7	< 5
epoxidized oil	61789-01-3	< 3

SECTION 4. FIRST AID MEASURES

If inhaled : Remove to fresh air.
If breathing is difficult, give oxygen.
Consult a physician if necessary.
If not breathing, give artificial respiration.
Get immediate medical advice/ attention.

In case of skin contact : Wash off immediately with soap and plenty of water.
Remove contaminated clothing and shoes.
If skin irritation occurs: Get medical advice/ attention.
Wash contaminated clothing before reuse.

In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/ attention.

If swallowed : Rinse mouth.
Get immediate medical advice/ attention.
Do not induce vomiting without medical advice.
Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed : Harmful in contact with skin or if inhaled.
Causes skin irritation.
Causes serious eye irritation.
May cause respiratory irritation.
May cause damage to organs through prolonged or repeated exposure.

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.

Specific hazards during fire fighting : The product will float on water and can be reignited on surface water.
Flash back possible over considerable distance.
In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

Hazardous combustion products : Chlorine compounds
Carbon oxides

Further information : Use water spray to cool unopened containers.
In case of fire and/or explosion do not breathe fumes.

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 : Wear appropriate personal protective equipment.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Keep container tightly closed.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
Wash skin thoroughly after handling.
Local authorities should be advised if significant spillages cannot be contained.

Environmental precautions : Avoid release to the environment.

Methods and materials for containment and cleaning up : Eliminate all ignition sources if safe to do so.
Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).
Use non-sparking tools.
Prevent runoff from entering drains, sewers, or streams.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling : Wear appropriate personal protective equipment.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Ground and bond container and receiving equipment.
Use explosion-proof electrical equipment.

Use non-sparking tools.
Take precautionary measures against static discharge.
Avoid contact with skin, eyes and clothing.
Wash skin thoroughly after handling.
Use only with adequate ventilation.
Do not breathe vapors or spray mist.
Do not taste or swallow.

Conditions for safe storage : Keep tightly closed in a dry, cool and well-ventilated place.
Storage of solutions near 25°C will minimize haze and gel formation.
Solutions may become hazy, partially precipitate from solution, or gel with time on exposure to low temperature. with mild agitation will generally return the product to its original condition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parame-ters / Permissible concentration	Basis
xylene	1330-20-7	TWA	100 ppm 435 mg/m3	OSHA Z-1
		TWA	100 ppm	ACGIH
		STEL	150 ppm	ACGIH
		STEL	150 ppm 655 mg/m3	OSHA P0
		TWA	100 ppm 435 mg/m3	OSHA P0
		TWA	100 ppm 435 mg/m3	ACGIH
		STEL	150 ppm 655 mg/m3	OSHA Z-1
		STEL	150 ppm	ACGIH
		TWA	100 ppm 435 mg/m3	OSHA Z-1
		TWA	100 ppm	ACGIH
		STEL	150 ppm	ACGIH
		STEL	150 ppm 655 mg/m3	OSHA P0
		TWA	100 ppm 435 mg/m3	OSHA P0
ethylbenzene	100-41-4	TWA	20 ppm	ACGIH
		TWA	100 ppm 435 mg/m3	NIOSH REL
		ST	125 ppm 545 mg/m3	NIOSH REL
		TWA	100 ppm 435 mg/m3	OSHA Z-1

		TWA	100 ppm 435 mg/m3	OSHA P0
		STEL	125 ppm 545 mg/m3	OSHA P0
chlorobenzene	108-90-7	TWA	10 ppm	ACGIH
		TWA	75 ppm 350 mg/m3	OSHA Z-1
		TWA	75 ppm 350 mg/m3	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 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 chemical-resistant gloves and protective clothing appropriate for the risk of exposure. Contact glove manufacturer for specific information.

Eye protection : Wear eye/face protection.

Skin and body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

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

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : viscous liquid

Color	:	amber
Odor	:	aromatic
Odor Threshold	:	not determined
pH	:	not determined
Melting point/range	:	
Boiling point/boiling range	:	280 - 284 °F / 138 - 140 °C
Flash point	:	81 °F / 27 °C Method: Tag closed cup
Evaporation rate	:	not determined
Vapor pressure	:	8.6 mbar (68 °F / 20 °C)
Relative vapor density	:	not determined
Relative density	:	0.97 (77 °F / 25 °C)
Solubility(ies) Water solubility	: :	 negligible
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	not determined
Decomposition temperature	:	Method: DSC No exotherm to 450°C
Viscosity Viscosity, dynamic	: :	 100 - 200 mPa,s (77 °F / 25 °C)
Viscosity, kinematic	:	103 - 206 mm2/s (77 °F / 25 °C)
Explosive properties	:	Not classified
Oxidizing properties	:	Not classified

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	None reasonably foreseeable.
Chemical stability	:	Stable under normal conditions.

Possibility of hazardous reactions	:	Stable
Conditions to avoid	:	Heat, flames and sparks.
Incompatible materials	:	Strong oxidizing agents
Hazardous decomposition products	:	Emits acrid smoke and fumes when heated to decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Harmful in contact with skin or if inhaled.

Components:

xylene:

Acute oral toxicity	:	LD50 Oral (Rat, male): 3,523 mg/kg

ethylbenzene:

Acute oral toxicity	:	LD50 Oral (Rat): 3,500 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): 17 mg/l Exposure time: 4 h
Acute dermal toxicity	:	LD50 Dermal (Rabbit): 15,400 mg/kg

chlorobenzene:

Acute oral toxicity	:	LD50 Oral (Rat): 2,262 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): 29.7 mg/l Exposure time: 4 h
Acute dermal toxicity	:	LD50 Dermal (Guinea pig): > 20,000 mg/kg

Skin corrosion/irritation

Causes skin irritation.

Product:

Remarks	:	No data available

Components:

xylene:

Species	:	Rabbit
Exposure time	:	24 h
Result	:	slight

ethylbenzene:

Species	:	Rabbit
Exposure time	:	24 h
Result	:	slight

chlorobenzene:

Species	:	Guinea pig
Exposure time	:	24 h
Result	:	slight

Serious eye damage/eye irritation

Causes serious eye irritation.

Product:

Remarks : No data available

Components:

xylene:

Species	:	Rabbit
Result	:	Severe irritation
Exposure time	:	24 h
Remarks	:	Causes serious eye irritation.

ethylbenzene:

Species	:	Rabbit
Result	:	moderate to strong

chlorobenzene:

Species	:	Rabbit
Result	:	slight

Respiratory or skin sensitization

Skin sensitization

Not classified based on available information.

Respiratory sensitization

Not classified based on available information.

Product:

Remarks : No data available

Components:

xylene:

Test Type	:	OECD 429: LLNA
Species	:	Mouse

Result : non-sensitizing

ethylbenzene:

Test Type : Skin Sensitization
Result : non-sensitizing

chlorobenzene:

Test Type : Skin Sensitization
Species : Guinea pig
Result : non-sensitizing

Germ cell mutagenicity

Not classified based on available information.

Components:

xylene:

Genotoxicity in vitro : Test Type: Salmonella typhimurium assay (Ames test)
Metabolic activation: +/- activation
Method: Bacterial Reverse Mutation Assay
Result: negative

Genotoxicity in vivo : Species: Rat
Application Route: intraperitoneal injection
Method: Genetic Toxicology: Rodent Dominant Lethal Test
Result: negative

chlorobenzene:

Genotoxicity in vitro : Test Type: Mutagenicity - Bacterial
Metabolic activation: +/- activation
Method: Bacterial Reverse Mutation Assay
Result: negative
Remarks: Published study

Test Type: Mutagenicity - Mammalian
Metabolic activation: +/- activation
Method: In vitro Mammalian Chromosome Aberration Test
Result: negative
Remarks: Published study

Test Type: Mutagenicity - Mammalian
Metabolic activation: +/- activation
Method: Genetic Toxicology: In Vitro Sister Chromatid Exchange Assay in Mammalian Cells
Result: negative
Remarks: Published study

Genotoxicity in vivo : Species: Drosophila melanogaster
Method: Genetic Toxicology: Sex-Linked Recessive Lethal Test in Drosophila melanogaster

Result: negative
Remarks: Published study

Carcinogenicity

Not classified based on available information.

Product:

Remarks : This information is not available.

IARC Group 2B: Possibly carcinogenic to humans
ethylbenzene 100-41-4

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

Not classified based on available information.

Product:

Effects on fertility : Remarks: No data available

STOT-single exposure

May cause respiratory irritation.

Product:

Remarks : No data available

Components:

xylene:

Target Organs : respiratory tract irritation

ethylbenzene:

Routes of exposure : Inhalation
Target Organs : Narcotic effects

chlorobenzene:

Routes of exposure : Inhalation
Target Organs : Narcotic effects

STOT-repeated exposure

May cause damage to organs (hearing organs) through prolonged or repeated exposure.

Product:

Remarks : No data available

Components:

xylene:

Target Organs	:	Auditory system

chlorobenzene:

Routes of exposure	:	Oral
Assessment	:	Based on available data, the classification criteria are not met.

Repeated dose toxicity

Components:

xylene:

Species	:	Rat, male and female
NOAEL	:	250 mg/kg
Application Route	:	Oral Study
Species	:	Rat, male
	:	3515 mg/m³
Application Route	:	Inhalation

chlorobenzene:

Species	:	Rat, male and female
NOAEL	:	120 mg/kg
Method	:	OECD Test No. 451: Carcinogenicity Studies
Remarks	:	Published study
Species	:	Rat, male and female
	:	235 mg/m³
Method	:	OECD Test No. 416: Two-Generation Reproduction Toxicity Study
Remarks	:	Published study

Aspiration toxicity

Not classified based on available information.

Product:

No aspiration toxicity classification

Components:

xylene:

May be fatal if swallowed and enters airways.

ethylbenzene:

May be fatal if swallowed and enters airways.

chlorobenzene:

May be harmful if swallowed and enters airways.

Information on likely routes of exposure

Product:

Inhalation	:	Remarks: May cause respiratory irritation.
Skin contact	:	Remarks: Causes skin irritation. Harmful in contact with skin.
Eye contact	:	Remarks: Causes serious eye irritation.
Ingestion	:	Remarks: May cause damage to organs through prolonged or repeated exposure.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

xylene:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 2.6 mg/l Exposure time: 96 h Remarks: Read-across from a similar material
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 3.4 mg/l Exposure time: 24 h
Toxicity to algae/aquatic plants	:	EC50 (Selenastrum capricornutum): 2.2 mg/l Exposure time: 72 h NOEC: (Selenastrum capricornutum): 0.44 mg/l Exposure time: 72 h
Toxicity to fish (Chronic toxicity)	:	NOEC (Oncorhynchus mykiss (rainbow trout)): > 1.3 mg/l Exposure time: 56 d GLP: no
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.96 mg/l Exposure time: 7 d

ethylbenzene:

Toxicity to fish	:	LC50 (Cyprinodon variegatus (sheepshead minnow)): 275 mg/l Exposure time: 96 h

LC50 (Pimephales promelas (fathead minnow)): 42.3 - 48.5 mg/l
Exposure time: 96 h

LC50 (Poecilia reticulata (guppy)): 97.1 mg/l
Exposure time: 96 h

chlorobenzene:

Toxicity to fish	:	LC50 (goldfish): 73.03 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (daphnid): 4.3 mg/l Exposure time: 48 h
Toxicity to fish (Chronic toxicity)	:	NOEC (Danio rerio (zebra fish)): 4.8 mg/l Exposure time: 28 d Remarks: Published study
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.32 mg/l Exposure time: 16 d Remarks: Published study

Persistence and degradability

Product:

Biochemical Oxygen Demand (BOD)	:	Remarks: No data available
Chemical Oxygen Demand (COD)	:	Remarks: No data available

Components:

xylene:

Biodegradability	:	Result: Readily biodegradable.

ethylbenzene:

Biodegradability	:	Result: Readily biodegradable.

chlorobenzene:

Biochemical Oxygen Demand (BOD)	:	BOD-5: 30 mg/g
Chemical Oxygen Demand (COD)	:	410 mg/g
BOD/COD	:	BOD/COD: 7.32 %

ThOD : 2,060 mg/g

Bioaccumulative potential

Components:

xylene:

Bioaccumulation : Bioconcentration factor (BCF): 7.4 - 18.5

ethylbenzene:

Partition coefficient: n-octanol/water : log Pow: 3.15

Mobility in soil

Components:

ethylbenzene:

Distribution among environmental compartments : log Koc: 3.12

chlorobenzene:

Distribution among environmental compartments : log Koc: 2.4

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

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

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 1139
Proper shipping name	:	Coating solution
Class	:	3
Packing group	:	III
Labels	:	Class 3 - Flammable liquids
Packing instruction (cargo aircraft)	:	366
Packing instruction (passenger aircraft)	:	355

IMDG-Code

UN number	:	UN 1139
Proper shipping name	:	COATING SOLUTION
Class	:	3
Packing group	:	III
Labels	:	3
EmS Code	:	F-E, S-E
Marine pollutant	:	no

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 1139
Proper shipping name	:	Coating solution
Class	:	3
Packing group	:	III
Labels	:	Class 3 - Flammable liquids
ERG Code	:	127
Marine pollutant	:	no

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)
xylene	1330-20-7	100	169
chlorobenzene	108-90-7	100	100 (D021)

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 : Flammable (gases, aerosols, liquids, or solids)
Acute toxicity (any route of exposure)
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:

xylene	1330-20-7
ethylbenzene	100-41-4
chlorobenzene	108-90-7

California Prop. 65

WARNING: This product can expose you to chemicals including ethylbenzene, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

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
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
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

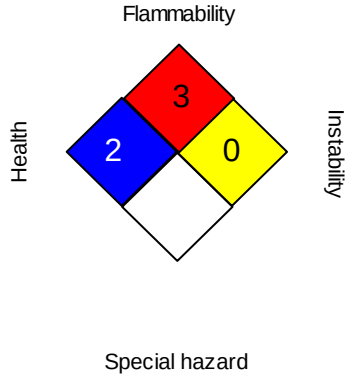
No substances are subject to a Significant New Use Rule.

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

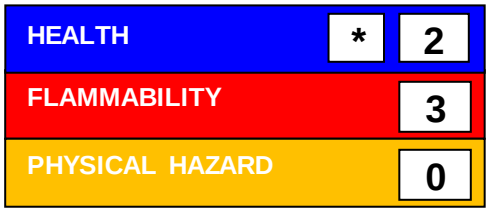
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



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	:	US. ACGIH Threshold Limit Values
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 / STEL	:	short-term exposure limit
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA P0 / TWA	:	8-hour time weighted average
OSHA P0 / STEL	:	Short-term exposure limit
OSHA Z-1 / TWA	:	8-hour time weighted average
OSHA Z-1 / STEL	:	15-minute occupational exposure limit

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 Substances 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

Revision Date : 02/12/2020

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