

ESBRIET® F.C. Tablets (267 mg)

Version	Revision Date:	Date of last issue: -
0.0	01-29-2020	Date of first issue: 01-29-2020

SECTION 1. IDENTIFICATION

Product name	:	ESBRIET® F.C. Tablets (267 r	ng)
Product code	:	RO022-0912/F09	
Manufacturer or supplier's o	deta	ails	
Company name of supplier	:	Genentech, Inc.	
Address	:	DNA Way 1 94080 South San Francisco CA USA	
Telephone	:	001-(650) 225-1000	
E-mail address Emergency telephone	:	info.sds@roche.com	
Emergency telephone num- ber	:	US Chemtrec phone	(800)-424-9300
Recommended use of the c	hen	nical and restrictions on use	
Recommended use	:	Formulated pharmaceutical ac	tive substance
Restrictions on use	:	For professional users only.	

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accor Acute toxicity (Oral)	dan :	ce with 29 CFR 1910.1200 Category 4
Carcinogenicity	:	Category 2
GHS label elements		
Hazard pictograms	:	
Signal Word	:	Warning
Hazard Statements	:	H302 Harmful if swallowed. H351 Suspected of causing cancer.
Precautionary Statements	:	 Prevention: P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P264 Wash skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P280 Wear protective gloves/ protective clothing/ eye protection/

Version 0.0 Revision Date: 01-29-2020 Date of last issue: -Date of first issue: 01-29-2020

face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Storage:

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

: Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
Pirfenidone	53179-13-8	81.2
Cellulose	9004-34-6	6.0
2-Pyrrolidinone, 1-ethenyl-, homo- polymer	9003-39-8	4.5
Silica	7631-86-9	2.4
Croscarmellose sodium	74811-65-7	1.8
Octadecanoic acid, magnesium salt (2:1)	557-04-0	0.5
Titanium oxide (TiO2)	13463-67-7	<= 1.0
non hazardous compounds	Not Assigned	2.7

SECTION 4. FIRST AID MEASURES

General advice	:	Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Do not leave the victim unattended.
If inhaled	:	Move to fresh air. If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	:	If on skin, rinse well with water.
In case of eye contact	:	Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing.

Version 0.0	Revision 01-29-20		Date of last issue: - Date of first issue: 01-29-2020
		lf eye	irritation persists, consult a specialist.
If swallowed	:	Do no Neve If sym	respiratory tract clear. It give milk or alcoholic beverages. If give anything by mouth to an unconscious person. Iptoms persist, call a physician. Imouth with water.
Most important and effects, bot delayed			ful if swallowed. ected of causing cancer.
Notes to physic	ian :		rst aid procedure should be established in consultation ne doctor responsible for industrial medicine.
SECTION 5. FIRE-F	IGHTING MEAS	URES	
Suitable extingu	ishing media :		xtinguishing measures that are appropriate to local nstances and the surrounding environment.
Unsuitable extir media	nguishing :	High	volume water jet
Specific hazard fighting	s during fire :	Do no cours	nt allow run-off from fire fighting to enter drains or water es.
Hazardous com ucts	bustion prod- :	produ Carbo	e of fire hazardous decomposition products may be ced such as: on oxides jen oxides (NOx)
Further informa	tion :	must Fire r	ct contaminated fire extinguishing water separately. This not be discharged into drains. esidues and contaminated fire extinguishing water must sposed of in accordance with local regulations.
Special protecti for fire-fighters	ve equipment :	Wear neces	self-contained breathing apparatus for firefighting if sary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protec- tive equipment and emer- gency procedures	:	Avoid exposure Avoid dust formation. Avoid breathing dust.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	:	Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

ESBRIET® F.C. Tablets (267 mg)

Vers 0.0	ion	Revision I 01-29-202		Date of last issue: - Date of first issue: 01-29-2020
	Advice on protection a fire and explosion	gainst :	Provide appropria is formed.	ate exhaust ventilation at places where dust
	Advice on safe handlir	ıg :	Do not breathe va For personal prot Smoking, eating a application area.	of respirable particles. apors/dust. ection see section 8. and drinking should be prohibited in the water in accordance with local and national
	Conditions for safe sto	rage :	place. Containers which kept upright to pr Electrical installat	ghtly closed in a dry and well-ventilated a are opened must be carefully resealed and event leakage. tions / working materials must comply with safety standards.
	Further information on age conditions	stor- :	See label, packa	ge insert or internal guidelines
	Storage temperature	:	to 30 °C Protect against lig Protect from mois	5
	Further information on age stability	stor- :	No decomposition	n if stored and applied as directed.

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
Pirfenidone	53179-13-8	IOEL	2 mg/m3	Roche In- dustrial Hy- giene Com- mittee (RIHC)
Cellulose	9004-34-6	TWA	10 mg/m3	ACGIH
		TWA (Res- pirable)	5 mg/m3	NIOSH REL
		TWA (total)	10 mg/m3	NIOSH REL
		TWA (total dust)	15 mg/m3	OSHA Z-1
		TWA (respir- able fraction)	5 mg/m3	OSHA Z-1
		TWA (Total dust)	15 mg/m3	OSHA P0
		TWÁ (respir- able dust fraction)	5 mg/m3	OSHA P0
Silica	7631-86-9	TWA (Dust)	20 Million particles per cubic	OSHA Z-3

Version 0.0 Revision Date: 01-29-2020

Date of last issue: -Date of first issue: 01-29-2020

			foot (Silica)	
		TWA (Dust)	80 mg/m3 / %SiO2 (Silica)	OSHA Z-3
		TWA	6 mg/m3 (Silica)	NIOSH REL
Titanium oxide (TiO2)	13463-67-7	TWA (total dust)	15 mg/m3	OSHA Z-1
		TWA (Total dust)	10 mg/m3	OSHA P0
		TWÁ	10 mg/m3 (Titanium dioxide)	ACGIH
Octadecanoic acid, magnesium salt (2:1)	557-04-0	TWA (Inhal- able fraction)	10 mg/m3	ACGIH
		TWA (Res- pirable frac- tion)	3 mg/m3	ACGIH

Predicted No Effect Concentration (PNEC):

Substance name	Environmental Compartment	Value
Pirfenidone	Surface waters	1.06 mg/l

Engineering measures	:	No data available
----------------------	---	-------------------

:

Personal protective equipment

Hand protection

Material

Remarks :	Wear appropriate protective gloves to prevent skin contact. Replace torn or punctured gloves promptly.
Eye protection :	Eye wash bottle with pure water Tightly fitting safety goggles
Skin and body protection :	Dust impervious protective suit Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Hygiene measures :	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

Protective gloves

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	tablet
Color	:	light yellow
Odor	:	Not applicable
Odor Threshold	:	Not applicable



ESBRIET® F.C. Tablets (267 mg)

Version 0.0 Revision Date: 01-29-2020

Date of last issue: -Date of first issue: 01-29-2020

рН	:	Not applicable
Melting point/range	:	No data available
Boiling point/boiling range	:	No data available
Evaporation rate	:	No data available
Self-ignition	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	Not applicable
Relative density	:	No data available
Solubility(ies) Water solubility	:	No data available
Solubility in other solvents	:	No data available
Partition coefficient: n- octanol/water	:	No data available
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity Viscosity, dynamic	:	Not applicable
Viscosity, kinematic	:	Not applicable
Explosive properties	:	No data available
Oxidizing properties	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reac- tions	:	No decomposition if stored and applied as directed.
Incompatible materials	:	No data available



ESBRIET® F.C. Tablets (267 mg)

Version 0.0

Revision Date: 01-29-2020

Date of last issue: -Date of first issue: 01-29-2020

Hazardous decomposition : No data available products

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity Harmful if swallowed.		
Product:		
Acute oral toxicity	:	Acute toxicity estimate: 1,571 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Acute toxicity estimate: 93.36 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method
Acute dermal toxicity	:	Acute toxicity estimate: > 5,000 mg/kg Method: Calculation method
Components:		
Pirfenidone:		
Acute oral toxicity	:	LD50 Oral (Rat): 1,295 mg/kg
Cellulose:		
Acute oral toxicity	:	LD50 Oral (Rat): > 5,000 mg/kg
Acute dermal toxicity	:	LD50 Dermal (Rabbit): > 2,000 mg/kg
Silica:		
Acute oral toxicity	:	LD50 Oral (Rat): > 3,300 mg/kg
Acute dermal toxicity	:	LD50 Dermal (Rabbit): > 5,000 mg/kg
Titanium oxide (TiO2):		
Acute oral toxicity	:	LD50 (Rat): > 7,500 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 6.82 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rabbit): > 10,000 mg/kg
Octadecanoic acid, magnes	iun	n salt (2:1):
Acute oral toxicity	:	LD50 Oral (Rat): > 2,000 mg/kg

Skin corrosion/irritation

Not classified based on available information.

ESBRIET® F.C. Tablets (267 mg) Version Revision Date: Date of last issue: -0.0 01-29-2020 Date of first issue: 01-29-2020 **Components: Pirfenidone:** Result No skin irritation Silica: Result No skin irritation 5 Serious eye damage/eye irritation Not classified based on available information. Components: **Pirfenidone:** Result No eye irritation : Silica: Result No eye irritation 1 Respiratory or skin sensitization Skin sensitization Not classified based on available information. **Respiratory sensitization** Not classified based on available information. Components: Silica: Result Did not cause sensitization on laboratory animals. : Germ cell mutagenicity Not classified based on available information. Carcinogenicity Suspected of causing cancer. **Components:** Cellulose: Remarks No ingredient of this product present at levels greater than or 1 equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC. IARC Group 2B: Possibly carcinogenic to humans Titanium oxide (TiO2) 13463-67-7 **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.

sion	Revision	Date:	Date of last issue: -
51011	01-29-20		Date of first issue: 01-29-2020
Reproductive Not classified b	toxicity based on available	e information.	
Components:			
Pirfenidone:			
Effects on fertil	lity :		boratory animal No effects on fertility.
Effects on fetal	l development :		boratory animal teratogenic potential.
STOT-single e	exposure based on available	information.	
<u>Components:</u>			
Silica:			
Assessment	:		nce or mixture is not classified as specific tar ant, single exposure.
Octadecanoic	acid, magnesiur	n salt (2:1):	
Assessment	:		nce or mixture is not classified as specific tar ant, single exposure.
STOT-repeate			
	based on available	e information.	
<u>Components:</u>			
Silica: Assessment	:		nce or mixture is not classified as specific tar ant, repeated exposure.
Octadecanoic	acid, magnesiur	n salt (2:1):	
Assessment	:	The substa	nce or mixture is not classified as specific tar ant, repeated exposure.
Aspiration tox	ticity based on available	information	
Components:		; miornauon.	
Silica:			
No data availal	ble		
-			
Octadecanoic	acid, magnesiur	n salt (2:1):	

Version 0.0

Revision Date: 01-29-2020

Date of last issue: -Date of first issue: 01-29-2020

Experience with human exposure

Components:

Pirfenidone:

General Information

: Symptoms: Nausea, Rash, Dizziness, digestive disorder, Vomiting, decrease in appetite, joint pain

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Pirfenidone:

Toxicity to algae/aquatic : plants	ErC50 (Pseudokirchneriella subcapitata (green algae)): 67.1 mg/l Method: OECD Test Guideline 201
	EbC50 (Pseudokirchneriella subcapitata (green algae)): 44 mg/l Method: OECD Test Guideline 201
	NOEC (Pseudokirchneriella subcapitata (green algae)): 18.3 mg/l Method: OECD Test Guideline 201
Toxicity to fish (Chronic tox- : icity)	NOEC (Pimephales promelas (fathead minnow)): 10.6 mg/l Exposure time: 28 d Test Type: Fish early-life stage (FELS) toxicity test (OECD 210) Method: OECD Test Guideline 210 Remarks: average measured concentration
Toxicity to daphnia and other : aquatic invertebrates (Chron- ic toxicity)	NOEC (Daphnia magna (Water flea)): 94 mg/l Exposure time: 21 d Method: OECD Test Guideline 211 Remarks: average measured concentration
Toxicity to microorganisms :	NOEC (activated sludge): 100 mg/l Exposure time: 3 h Test Type: Respiration inhibition Method: OECD Test Guideline 209 Remarks: Barely inhibitory on aerobic bacterial respiration
	(activated sludge): 578 mg/l Exposure time: 3 h Test Type: Respiration inhibition Method: OECD Test Guideline 209 Remarks: Barely inhibitory on aerobic bacterial respiration

Vers 0.0		Revisio 01-29-2		
	Cellulose:			
	Ecotoxicology Assess Acute aquatic toxicity	sment	:	This product has no known ecotoxicological effects.
	Chronic aquatic toxicity		:	This product has no known ecotoxicological effects.
	Silica:			
	Toxicity to daphnia and aquatic invertebrates	other	:	EC0 (Daphnia magna (Water flea)): > 10,000 mg/l Exposure time: 24 h
	Toxicity to algae/aquation plants	C	:	IC50 (Pseudokirchneriella subcapitata (green algae)): 440 mg/l Exposure time: 72 h
				NOEC (Pseudokirchneriella subcapitata (green algae)): 60 mg/l Exposure time: 72 h
	Ecotoxicology Assess	sment		
	Toxicity Data on Soil		:	Not expected to adsorb on soil.
	Other organisms releva the environment	nt to	:	No data available
	Titanium oxide (TiO2)	:		
	Toxicity to fish		:	LC0 (Leuciscus idus (Golden orfe)): > 1,000 mg/l Exposure time: 48 h
	Toxicity to daphnia and aquatic invertebrates	other	:	EC0 (Daphnia magna (Water flea)): 3 mg/l Exposure time: 720 h
	Ecotoxicology Assess	sment		
	Toxicity Data on Soil		:	Not expected to adsorb on soil.
	Other organisms releva	nt to	:	No data available
	Octadecanoic acid, m	agnesiı	um	salt (2:1):
	Ecotoxicology Assess Acute aquatic toxicity	sment	:	This product has no known ecotoxicological effects.
	Chronic aquatic toxicity		:	This product has no known ecotoxicological effects.
	Toxicity Data on Soil		:	Not expected to adsorb on soil.
	Other organisms releva	nt to	:	No data available

ESBRIET® F.C. Ta	ESBRIET® F.C. Tablets (267 mg)				
Version 0.0	Revision 01-29-202		Date of last issue: - Date of first issue: 01-29-2020		
Persistence and dec	gradability				
Components:					
Pirfenidone: Biodegradability	:	Biodegradation: Exposure time:			
Bioaccumulative po	tential				
Components:					
Pirfenidone:					
Partition coefficient: n octanol/water	- :	log Pow: 0.9			
Cellulose:					
Partition coefficient: n octanol/water	- :	Remarks: No da	ata available		
Silica:					
Partition coefficient: n octanol/water	- :	Remarks: No da	ata available		
Titanium oxide (TiO	2):				
Partition coefficient: n octanol/water	- :	Remarks: No da	ata available		
Octadecanoic acid,	Octadecanoic acid, magnesium				
Partition coefficient: n octanol/water	- :	log Pow: 0.8 Method: OECD	Test Guideline 107		
Mobility in soil					
No data available					
Other adverse effect	s				
Product:					
Ozone-Depletion Pote	ential :	tection of Strato Substances Remarks: This p tured with a Cla	CFR Protection of Environment; Part 82 Pro- spheric Ozone - CAA Section 602 Class I product neither contains, nor was manufac- ss I or Class II ODS as defined by the U.S. ection 602 (40 CFR 82, Subpt. A, App.A + B).		
Additional ecological mation	nfor- :		al hazard cannot be excluded in the event of nandling or disposal. tic life.		

Version	Revision Date:	Date of last issue: -
0.0	01-29-2020	Date of first issue: 01-29-2020

Components:

Pirfenidone:

Results of PBT and vPvB	:	This substance is not considered to be persistent, bioaccumu-
assessment		lating and toxic (PBT). This substance is not considered to be
		very persistent and very bioaccumulating (vPvB).

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods	
Waste from residues	 The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company. Can be disposed as waste water, when in compliance with local regulations.
Contaminated packaging	 Empty remaining contents. Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

Not regulated as a dangerous good

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable

Domestic regulation

49 CFR Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

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

ESBRIET® F.C. Tablets (267 mg)

Version 0.0

Revision Date: 01-29-2020

Date of last issue: -Date of first issue: 01-29-2020

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

Components	CAS-No.	Component TPQ (lbs)
SARA 311/312 Hazards	: Acute toxicity (any i Carcinogenicity	oute of exposure)

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

US State Regulations

Penn

Massachusetts Right To Know

Cellulose	9004-34-6
Silica	7631-86-9
Titanium oxide (TiO2)	13463-67-7
nsylvania Right To Know	
Pirfenidone	53179-13-8
Cellulose	9004-34-6
2-Pyrrolidinone, 1-ethenyl-, homopolymer	9003-39-8
Silica	7631-86-9
Titanium oxide (TiO2)	13463-67-7

Maine Chemicals of High Concern

Vermont Chemicals of High Concern

Washington Chemicals of High Concern

California Prop. 65

WARNING: This product can expose you to chemicals including Titanium oxide (TiO2), which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances

2-Pyrrolidinone, 1-ethenyl-, homopolymer	9003-39-8
Silica	7631-86-9

California Permissible Exposure Limits for Chemical Contaminants

Cellulose	9004-34-6
Silica	7631-86-9
Titanium oxide (TiO2)	13463-67-7

Vers 0.0	rsion Revision I 0 01-29-202			Date of last issue: - Date of first issue: 01-29-2020
	The ingredients of t	 f this product are reported in the following inventories: This product contains the following components that are not on the Canadian DSL nor NDSL. 		he following inventories:
	DSL			
			Pirfenidone	
			non hazardous c	ompounds
			Croscarmellose	sodium
	AICS	:	Not in complianc	e with the inventory
	NZIoC	:	Not in complianc	e with the inventory
	ENCS	:	Not in complianc	e with the inventory
	ISHL	:	Not in complianc	e with the inventory
	KECI	:	Not in complianc	e with the inventory
	PICCS	:	Not in complianc	e with the inventory
	IECSC	:	Not in complianc	e with the inventory
	TCSI	:	Not in complianc	e with the inventory
	TSCA	:	Substance(s) no	t listed on TSCA inventory

TSCA list

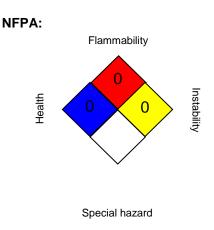
No substances are subject to a Significant New Use Rule.

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

SECTION 16. OTHER INFORMATION

Version 0.0

Revision Date: 01-29-2020



Date of last issue: -Date of first issue: 01-29-2020

HMIS® IV:

HEALTH	*	1
FLAMMABILITY		0
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 NIOSH REL	:	USA. ACGIH Threshold Limit Values (TLV) 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 Lim- its for Air Contaminants
OSHA Z-3	:	USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
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
OSHA Z-3 / 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 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

Version 0.0 Revision Date: 01-29-2020

Date of last issue: -Date of first issue: 01-29-2020

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

: 01-29-2020

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 / 1810