



CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/¹³C12, 99%) IN NONANE

Safety Data Sheet

according to Regulation (EC) No. 453/2010 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 16/05/2016

Revision date:

Version: 1.0

EO-5319-A-CS3

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

1.1. Product identifier

Product form : Mixture
Product name. : CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/¹³C12, 99%) IN NONANE
Product code : EO-5319-A-CS3

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

1.2.1. Relevant identified uses

Industrial/Professional use spec : For professional use only.

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Cambridge Isotope Laboratories, Inc.
50 Frontage Road
Andover, MA 01810
USA

USA: 1-800-322-1174 Int: 1-978-749-8000
cilsales@isotope.com www.isotope.com

Emergency telephone number

Emergency numbers:

Chemtrec: 1-800-424-9300 (24 hours)
International: 1-703-741-5970 (24 hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flam. Liq. 3	H226
Acute Tox. 4 (Inhalation:dust,mist)	H332
Skin Irrit. 2	H315
Eye Irrit. 2	H319
STOT SE 3	H336
Asp. Tox. 1	H304

Full text of H-phrases: see section 16

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

F; R11
Xn; R20
Xn; R65
Xi; R38

Full text of R-phrases: see section 16

GHS-US classification

Flam. Liq. 3	H226
Acute Tox. 4 (Inhalation:dust,mist)	H332
Skin Irrit. 2	H315
Eye Irrit. 2A	H319
STOT SE 3	H336
Asp. Tox. 1	H304

Adverse physicochemical, human health and environmental effects

Central Nervous System.

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2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



GHS02

GHS08

GHS07

Signal word (CLP) :

Danger

Hazard statements (CLP) :

H226 - Flammable liquid and vapour
H304 - May be fatal if swallowed and enters airways
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H332 - Harmful if inhaled
H336 - May cause drowsiness or dizziness

Precautionary statements (CLP) :

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P233 - Keep container tightly closed
P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical, lighting, ventilating equipment
P261 - Avoid breathing dust, fume, gas, mist, spray, vapours
P264 - Wash Both hands thoroughly after handling
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective clothing, protective gloves

GHS-US labelling

Hazard pictograms (GHS-US) :



GHS02

GHS08

GHS07

Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H226 - Flammable liquid and vapour
H304 - May be fatal if swallowed and enters airways
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H332 - Harmful if inhaled
H336 - May cause drowsiness or dizziness

Precautionary statements (GHS-US) :

P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking
P233 - Keep container tightly closed
P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical, lighting, ventilating equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P261 - Avoid breathing dust, fume, gas, mist, spray, vapours
P264 - Wash Both hands thoroughly after handling
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective clothing, protective gloves
P301+P310 - IF SWALLOWED: immediately call a POISON CENTER or doctor/physician
P302+P352 - IF ON SKIN: Wash with plenty of soap and water
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - IF INHALED: remove victim to fresh air and keep at rest in a position comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P312 - Call a POISON CENTER/doctor/physician if you feel unwell
P321 - Specific treatment (see Hazard pictograms (CLP) on this label)
P331 - If swallowed, do NOT induce vomiting
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 Alcohol resistant foam, Carbon dioxide., Dry chemical, Water spray for extinction
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

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P501 - Dispose of contents/container to Comply with applicable regulations.

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification according to Directive 67/548/EEC
N-NONANE UNLABELED	(CAS No) 111-84-2 (EC no) 203-913-4	99.99971142	R10 Xn; R20 Xn; R65 R67 Xi; R38
DECABDE (BDE-209) (13C12, 99%)	(CAS No) 1163-19-5 (Unlabeled) (EC no) 214-604-9 (Unlabeled)	0.00006964	T; R25 Xn; R20 Xn; R22
2,2',3,3',4,5,5',6,6'-NONACB (PCB-208) (13C12, 99%)	(CAS No) 52663-77-1 (Unlabeled) (EC index no) 602-039-00-4	0.00001393	Xn; R48/20/21/22 N; R50/53 R33
2,2',4,4',5-PENTABDE (BDE-99) (13C12, 99%)	(CAS No) 60348-60-9 (Unlabeled)	0.00001045	Carc.Cat.1; R45 Carc.Cat.1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',4,4',5,5'-HEXABB (PBB-153) (13C12, 99%)	(CAS No) 59080-40-9 (Unlabeled)	0.00001045	T+; R27 T; R25 Xn; R21 Xn; R22 Xi; R36 Xi; R38 R48
2,4,4'-TRIBDE (BDE-28) (13C12, 99%)	(CAS No) 41318-75-6 (Unlabeled)	0.00001045	Xn; R20/21/22 Carc.Cat.2; R45 Carc.Cat.2; R49
2,2',4,4'-TETRABDE (BDE-47) (13C12, 99%)	(CAS No) 5436-43-1 (Unlabeled)	0.00001045	Xn; R20/21/22
2,2',4,4',5,5'-HEXABDE (BDE-153) (13C12, 99%)	(CAS No) 68631-49-2 (Unlabeled)	0.00001045	Carc.Cat.1; R45 Carc.Cat.1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',4,4',5,6'-HEXABDE (BDE-154) (13C12, 99%)	(CAS No) 488710-23-2	0.00001045	Carc.Cat.1; R45 Carc.Cat.1; R49 Xn; R20 Xn; R21 Xn; R22 N; R50
2,2',3,4,4',5,6'-HEPTABDE (BDE-183) (13C12, 99%)	(CAS No) 207122-16-5 (Unlabeled)	0.00001045	Carc.Cat.1; R45 Carc.Cat.1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',3,3',4,4',5,6,6'-NONABDE (BDE-207) (13C12, 99%)	(CAS No) 437701-79-6 (Unlabeled)	0.00001045	Xn; R20/21/22 N; R50/53

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Name	Product identifier	%	Classification according to Directive 67/548/EEC
3,3',4,4'-TETRABDE (BDE-77) (13C12, 99%)	(CAS No) 93703-48-1 (Unlabeled)	0.00001045	Carc.Cat.1; R45 Carc.Cat.1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',3,4,4',6-HEXABDE (BDE-139) (13C12, 99%)	(CAS No) 488710-25-4	0.00001045	Carc.Cat.1; R45 Carc.Cat.1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',4,4',6-PENTABDE (BDE-100) (13C12, 99%)	(CAS No) 189084-64-8 (Unlabeled)	0.00001045	Carc.Cat.1; R45 Carc.Cat.1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',3,3',4,4',6,6'-OCTABDE (BDE-197) (13C12, 99%)	(CAS No) 117964-21-3 (Unlabeled)	0.00001045	Carc.Cat.1; R45 Carc.Cat.1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',3,3',4,5,5',6,6'-NONABDE (BDE-208) (13C12, 99%)	(CAS No) 437701-78-5 (Unlabeled)	0.00001045	Carc.Cat.1; R45 Carc.Cat.1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',3,4,4',5,5',6-OCTABDE (BDE-203) (13C12, 99%)	(CAS No) 337513-72-1 (Unlabeled)	0.00001045	Carc.Cat.1; R45 Carc.Cat.1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',3,3',4,4',5,5',6-NONABDE (BDE-206) (13C12, 99%)	(CAS No) 63387-28-0 (Unlabeled)	0.00001045	Carc.Cat.1; R45 Carc.Cat.1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
HEXABROMOBENZENE (13C6, 99%)	(CAS No) 87-82-1 (Unlabeled) (EC no) 201-773-9	0.00001045	Xn; R20/21/22 Xi; R36/37/38 R53
GAMMA-HEXABROMOCYCLODODECANE (13C12, 99%)	(CAS No) 25637-99-4 (Unlabeled)	0.00001045	Repr.Cat.3; R62 Repr.Cat.3; R63 R43 N; R50/53
1,2-BIS (PENTABROMOPHENYL) ETHANE (13C14, 99%)	(CAS No) 84852-53-9 (Unlabeled) (EC no) 284-366-9	0.00001045	Carc.Cat.3; R40 Xn; R22 Xi; R41 N; R51/53
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE (13C12, 99%)	(CAS No) 37853-59-1	0.00001045	Xi; R36/37/38 Xn; R22 R52/53
1,2,3,4-TETRACHLORODIBENZO-P-DIOXIN (13C12, 99%)	(CAS No) 116865-58-8	0.00000348	Muta.Cat.3; R68 T+; R27 Xn; R65 R53

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Name	Product identifier	%	Classification according to Directive 67/548/EEC
2,2',4'-TRIBDE (BDE-17) UNLABELED	(CAS No) 147217-75-2	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,4,4'-TRIBDE (BDE-28) UNLABELED	(CAS No) 41318-75-6	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',4,4',5,5'-HEXABDE (BDE-153) UNLABELED	(CAS No) 68631-49-2	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',3,4,4',5',6'-HEPTABDE (BDE-183) UNLABELED	(CAS No) 207122-16-5	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',4,4',5,6'-HEXABDE (BDE-154) UNLABELED	(CAS No) 207122-15-4	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',3,4,4',5,5',6'-OCTABDE (BDE-203) UNLABELED	(CAS No) 337513-72-1	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',3,3',4,4',6,6'-OCTABDE (BDE-197) UNLABELED	(CAS No) 117964-21-3	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',3,3',4,5,5',6,6'-NONABDE (BDE-208) UNLABELED	(CAS No) 437701-78-5	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',3,3',4,4',5,6,6'-NONABDE (BDE-207) UNLABELED	(CAS No) 437701-79-6	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',3,3',4,4',5,5',6'-NONABDE (BDE-206) UNLABELED	(CAS No) 63387-28-0	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53

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DECABDE (BDE-209) UNLABELED substance listed as REACH Candidate ("Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)")	(CAS No) 1163-19-5 (EC no) 214-604-9	0.00000014	T; R25 Xn; R20 Xn; R22
2,2',3,4,4'-PENTABDE (BDE-85) UNLABELED	(CAS No) 182346-21-0	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',4,4',5-PENTABDE (BDE-99) UNLABELED	(CAS No) 60348-60-9	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',4,4',5,5'-HEXABB (PBB-153) UNLABELED	(CAS No) 59080-40-9	0.00000014	T+; R27 T; R25 Xn; R21 Xn; R22 Xi; R36 Xi; R38 R48
2,2',4,4',6-PENTABDE (BDE-100) UNLABELED	(CAS No) 189084-64-8	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
GAMMA-HEXABROMOCYCLODODECANE UNLABELED substance listed as REACH Candidate (Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified) substance listed in REACH Annex XIV (Hexabromocyclododecane (HBCDD) (alpha-, beta-, gamma-))	(CAS No) 25637-99-4 (EC no) 221-695-9	0.00000014	N; R50/53
HEXABROMOBENZENE UNLABELED	(CAS No) 87-82-1 (EC no) 201-773-9	0.00000014	Xn; R20/21/22 Xi; R36/37/38 R53
2,2',3,3',4,4',5,6'-OCTABDE (BDE-196) UNLABELED		0.00000014	F; R11 Xi; R38 N; R50/53 R67 Xn; R65
1,2-BIS(PENTABROMOPHENYL)ETHANE UNLABELED	(CAS No) 84852-53-9 (EC no) 284-366-9	0.00000014	Carc. Cat. 3; R40 Xn; R22 Xi; R41 N; R51/53
2,3',4,4'-TETRABDE (BDE-66) UNLABELED	(CAS No) 189084-61-5	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
2,2',4,4'-TETRABDE (BDE-47) UNLABELED	(CAS No) 5436-43-1	0.00000014	Carc. Cat. 1; R45 Carc. Cat. 1; R49 Xn; R22 Xi; R41 Xi; R37 Xi; R38 N; R51/53
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE UNLABELED	(CAS No) 37853-59-1	0.00000014	Xi; R36/37/38 Xn; R22 R52/53

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N-NONANE UNLABELED	(CAS No) 111-84-2 (EC no) 203-913-4	99.99971142	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation:vapour), H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H336 Asp. Tox. 1, H304
DECABDE (BDE-209) (13C12, 99%)	(CAS No) 1163-19-5 (Unlabeled) (EC no) 214-604-9 (Unlabeled)	0.00006964	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation), H332
2,2',3,3',4,5,5',6,6'-NONACB (PCB-208) (13C12, 99%)	(CAS No) 52663-77-1 (Unlabeled) (EC index no) 602-039-00-4	0.00001393	Carc. 1B, H350 STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
2,2',4,4',5-PENTABDE (BDE-99) (13C12, 99%)	(CAS No) 60348-60-9 (Unlabeled)	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H335 Aquatic Chronic 2, H411
2,2',4,4',5,5'-HEXABB (PBB-153) (13C12, 99%)	(CAS No) 59080-40-9 (Unlabeled)	0.00001045	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Skin Irrit. 2, H315 Carc. 1A, H350 Carc. 1B, H350 STOT RE 1, H372
2,4,4'-TRIBDE (BDE-28) (13C12, 99%)	(CAS No) 41318-75-6 (Unlabeled)	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',4,4'-TETRABDE (BDE-47) (13C12, 99%)	(CAS No) 5436-43-1 (Unlabeled)	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',4,4',5,5'-HEXABDE (BDE-153) (13C12, 99%)	(CAS No) 68631-49-2 (Unlabeled)	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',4,4',5,6'-HEXABDE (BDE-154) (13C12, 99%)	(CAS No) 488710-23-2	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',3,4,4',5',6-HEPTABDE (BDE-183) (13C12, 99%)	(CAS No) 207122-16-5 (Unlabeled)	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',3,3',4,4',5,6,6'-NONABDE (BDE-207) (13C12, 99%)	(CAS No) 437701-79-6 (Unlabeled)	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
3,3',4,4'-TETRABDE (BDE-77) (13C12, 99%)	(CAS No) 93703-48-1 (Unlabeled)	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',3,4,4',6-HEXABDE (BDE-139) (13C12, 99%)	(CAS No) 488710-25-4	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411

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2,2',4,4',6-PENTABDE (BDE-100) (13C12, 99%)	(CAS No) 189084-64-8 (Unlabeled)	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',3,3',4,4',6,6'-OCTABDE (BDE-197) (13C12, 99%)	(CAS No) 117964-21-3 (Unlabeled)	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',3,3',4,5,5',6,6'-NONABDE (BDE-208) (13C12, 99%)	(CAS No) 437701-78-5 (Unlabeled)	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 Carc. 1A, H350i STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',3,4,4',5,5',6-OCTABDE (BDE-203) (13C12, 99%)	(CAS No) 337513-72-1 (Unlabeled)	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',3,3',4,4',5,5',6-NONABDE (BDE-206) (13C12, 99%)	(CAS No) 63387-28-0 (Unlabeled)	0.00001045	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
HEXABROMOBENZENE (13C6, 99%)	(CAS No) 87-82-1 (Unlabeled) (EC no) 201-773-9	0.00001045	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 Aquatic Chronic 4, H413
GAMMA-HEXABROMOCYCLODODECANE (13C12, 99%)	(CAS No) 25637-99-4 (Unlabeled)	0.00001045	Lact., H362 Repr. 2, H361 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
1,2-BIS (PENTABROMOPHENYL) ETHANE (13C14, 99%)	(CAS No) 84852-53-9 (Unlabeled) (EC no) 284-366-9	0.00001045	Acute Tox. 4 (Oral), H302 Eye Dam. 1, H318 Carc. 2, H351 Aquatic Chronic 2, H411
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE (13C12, 99%)	(CAS No) 37853-59-1	0.00001045	Acute Tox. 4 (Oral), H302 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 Aquatic Chronic 3, H412
1,2,3,4-TETRACHLORODIBENZO-P-DIOXIN (13C12, 99%)	(CAS No) 116865-58-8	0.00000348	Acute Tox. 1 (Dermal), H310 Muta. 2, H341 STOT SE 2, H371 Asp. Tox. 1, H304 Aquatic Chronic 4, H413
2,2',4-TRIBDE (BDE-17) UNLABELED	(CAS No) 147217-75-2	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,4,4'-TRIBDE (BDE-28) UNLABELED	(CAS No) 41318-75-6	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',4,4',5,5'-HEXABDE (BDE-153) UNLABELED	(CAS No) 68631-49-2	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE EO-5319-A-CS3

Safety Data Sheet

according to Regulation (EC) No. 453/2010 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
2,2',3,4,4',5,6-HEPTABDE (BDE-183) UNLABELED	(CAS No) 207122-16-5	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',4,4',5,6'-HEXABDE (BDE-154) UNLABELED	(CAS No) 207122-15-4	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',3,4,4',5,5',6-OCTABDE (BDE-203) UNLABELED	(CAS No) 337513-72-1	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',3,3',4,4',6,6'-OCTABDE (BDE-197) UNLABELED	(CAS No) 117964-21-3	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',3,3',4,5,5',6,6'-NONABDE (BDE-208) UNLABELED	(CAS No) 437701-78-5	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',3,3',4,4',5,6,6'-NONABDE (BDE-207) UNLABELED	(CAS No) 437701-79-6	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',3,3',4,4',5,5',6-NONABDE (BDE-206) UNLABELED	(CAS No) 63387-28-0	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
DECABDE (BDE-209) UNLABELED substance listed as REACH Candidate ("Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)")	(CAS No) 1163-19-5 (EC no) 214-604-9	0.00000014	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation), H332 Acute Tox. 4 (Inhalation:dust,mist), H332
2,2',3,4,4'-PENTABDE (BDE-85) UNLABELED	(CAS No) 182346-21-0	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',4,4',5-PENTABDE (BDE-99) UNLABELED	(CAS No) 60348-60-9	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',4,4',5,5'-HEXABB (PBB-153) UNLABELED	(CAS No) 59080-40-9	0.00000014	Acute Tox. 3 (Oral), H301 Acute Tox. 1 (Dermal), H310 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
2,2',4,4',6-PENTABDE (BDE-100) UNLABELED	(CAS No) 189084-64-8	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 2, H411 Carc. 1A, H350
GAMMA-HEXABROMOCYCLODODECANE UNLABELED substance listed as REACH Candidate (Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified) substance listed in REACH Annex XIV (Hexabromocyclododecane (HBCDD) (alpha-, beta-, gamma-))	(CAS No) 25637-99-4 (EC no) 221-695-9	0.00000014	Aquatic Acute 1, H400 (M=100) Aquatic Chronic 1, H410

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE EO-5319-A-CS3

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Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
HEXABROMOBENZENE UNLABELED	(CAS No) 87-82-1 (EC no) 201-773-9	0.00000014	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 Aquatic Chronic 4, H413
2,2',3,3',4,4',5,6'-OCTABDE (BDE-196) UNLABELED		0.00000014	Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
1,2-BIS(PENTABROMOPHENYL)ETHANE UNLABELED	(CAS No) 84852-53-9 (EC no) 284-366-9	0.00000014	Acute Tox. 4 (Oral), H302 Eye Dam. 1, H318 Carc. 2, H351 Aquatic Chronic 2, H411
2,3',4,4'-TETRABDE (BDE-66) UNLABELED	(CAS No) 189084-61-5	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
2,2',4,4'-TETRABDE (BDE-47) UNLABELED	(CAS No) 5436-43-1	0.00000014	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1A, H350 STOT SE 3, H336 Aquatic Chronic 2, H411
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE UNLABELED	(CAS No) 37853-59-1	0.00000014	Acute Tox. 4 (Oral), H302 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 Aquatic Chronic 3, H412

Name	Product identifier	%	GHS-US classification
N-NONANE UNLABELED	(CAS No) 111-84-2	99.99971142	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation:vapour), H332 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H336 Asp. Tox. 1, H304
1,2,3,4-TETRACHLORODIBENZO-P-DIOXIN (13C12, 99%)	(CAS No) 116865-58-8	0.00000348	Acute Tox. 1 (Dermal), H310 Muta. 2, H341 STOT SE 2, H371 Asp. Tox. 1, H304
2,2',3,3',4,4',5,6'-OCTABDE (BDE-196) UNLABELED		0.00000014	Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410

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

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
First-aid measures after inhalation	: Remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER/doctor/physician if you feel unwell.
First-aid measures after skin contact	: Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation occurs: Wash with soap and plenty of water. Consult a physician. Get medical advice/attention. Specific treatment (see Hazard pictograms (CLP) on this label).
First-aid measures after eye contact	: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
First-aid measures after ingestion	: Immediately call a POISON CENTER or doctor/physician.

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

Symptoms/injuries after inhalation	: Danger of serious damage to health by prolonged exposure through inhalation. Harmful if inhaled. May cause drowsiness or dizziness.
Symptoms/injuries after skin contact	: Causes skin irritation.

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE EO-5319-A-CS3

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Symptoms/injuries after eye contact : Causes eye irritation.
Symptoms/injuries after ingestion : May be fatal if swallowed and enters airways.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Flammable liquid and vapour.
Explosion hazard : May form flammable/explosive vapour-air mixture.
Reactivity : Vapors may form explosive mixture with air.

5.3. Advice for firefighters

Firefighting instructions : Use water spray to cool unopened containers.
Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Remove ignition sources. Use special care to avoid static electric charges. No naked lights. No smoking.

6.1.1. For non-emergency personnel

Emergency procedures : Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

6.1.2. For emergency responders

Protective equipment : Avoid breathing dust, mist or spray.

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3. Methods and material for containment and cleaning up

For containment : Contain spillage, then collect with non-combustible absorbent material. Disposal should be in accordance with applicable Federal, State and local regulations.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Handle empty containers with care because residual vapours are flammable.
Precautions for safe handling : No naked lights. No smoking. Take precautionary measures against static discharge. Use only non-sparking tools. Use only outdoors or in a well-ventilated area. Avoid breathing dust, mist or spray.
Hygiene measures : Wash Both hands thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical equipment.
Storage conditions : Store at room temperature away from light and moisture.
Incompatible materials : Heat sources.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE		
Italy - Portugal - USA ACGIH	ACGIH TWA (ppm)	200.0000000000 ppm Central Nervous System impairment.
DECABDE (BDE-209) UNLABELED (1163-19-5)		
USA OSHA	OSHA PEL (TWA) (mg/m3)	5.0000000000 mg/m ³

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE EO-5319-A-CS3

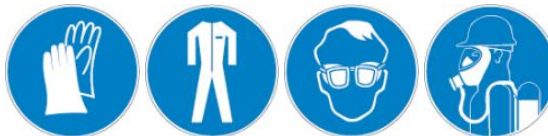
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DECABDE (BDE-209) (13C12, 99%) (1163-19-5 (Unlabeled))		
USA OSHA	OSHA PEL (TWA) (mg/m ³)	5.0000000000 mg/m ³
N-NONANE UNLABELED (111-84-2)		
Italy - Portugal - USA ACGIH	ACGIH TWA (ppm)	200.0000000000 ppm Central Nervous System impairment.
1,2-BIS(PENTABROMOPHENYL)ETHANE UNLABELED (84852-53-9)		
Italy - Portugal - USA ACGIH	ACGIH TWA (mg/m ³)	10.0000000000 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15.0000000000 mg/m ³
1,2-BIS (PENTABROMOPHENYL) ETHANE (13C14, 99%) (84852-53-9 (Unlabeled))		
Italy - Portugal - USA ACGIH	ACGIH TWA (mg/m ³)	10.0000000000 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15.0000000000 mg/m ³
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE UNLABELED (37853-59-1)		
Italy - Portugal - USA ACGIH	ACGIH TWA (mg/m ³)	10 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE (13C12, 99%) (37853-59-1)		
Italy - Portugal - USA ACGIH	ACGIH TWA (mg/m ³)	10 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15

8.2. Exposure controls

Personal protective equipment : Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.



Hand protection : Wear suitable protective clothing and gloves.
 Eye protection : Wear safety glasses with side shields (or goggles) and a face shield.
 Skin and body protection : Wear suitable protective clothing.
 Respiratory protection : Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. Wear respiratory protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

The properties listed below are for the solvent, the main component of this mixture.

Physical state : Liquid
 Appearance : Liquid.
 Molecular mass : 128.3 g/mol
 Colour : Colourless.
 Odour : No data available
 Odour threshold : No data available
 pH : No data available
 Relative evaporation rate (butylacetate=1) : No data available
 Melting point : No data available
 Freezing point : -53 °C (- 63 °F) - lit
 Boiling point : 151 °C (304 °F) - lit
 Flash point : 31.0 °C (87.8 °F) - closed cup
 Self ignition temperature : 205 °C (401 °F)
 Decomposition temperature : No data available
 Flammability (solid, gas) : No data available
 Vapour pressure : 12.4 hPa (9.3 mmHg) at 37.7 °C (99.9 °F)
 Relative vapour density at 20 °C : No data available
 Relative density : No data available
 Density : 0.718 g/ml at 25 °C (77 °F)
 Solubility : Water: 0 %

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE EO-5319-A-CS3

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Log Pow	: 5.65
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: 0.87 - 2.9 % (V)

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Vapors may form explosive mixture with air.

10.2. Chemical stability

See storage and expiration date on CoA.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Open flame. Overheating. Direct sunlight. Heat. Sparks.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

May release flammable gases.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Harmful if inhaled.

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE	
LC50 inhalation rat (mg/l)	23760 mg/m ³ male - 4 h
LC50 inhalation rat (ppm)	3200 ppm/4h
ATE (gases)	3200.000 ppmV/4h
ATE (vapours)	11.000 mg/l/4h
ATE (dust,mist)	1.500 mg/l/4h

DECABDE (BDE-209) UNLABELED (1163-19-5)	
ATE (oral)	500.000 mg/kg bodyweight
ATE (dermal)	1100.000 mg/kg bodyweight
ATE (gases)	4500.000 ppmV/4h
ATE (vapours)	11.000 mg/l/4h
ATE (dust,mist)	1.500 mg/l/4h

2,2',4,4',5,5'-HEXABB (PBB-153) UNLABELED (59080-40-9)	
ATE (oral)	100.000 mg/kg bodyweight
ATE (dermal)	5.000 mg/kg bodyweight

2,2',4,4',5-PENTABDE (BDE-99) (13C12, 99%) (60348-60-9 (Unlabeled))	
	LD50 Intraperitoneal-mouse-125mg/kg

DECABDE (BDE-209) (13C12, 99%) (1163-19-5 (Unlabeled))	
ATE (oral)	500.000 mg/kg bodyweight
ATE (dermal)	1100.000 mg/kg bodyweight
ATE (gases)	4500.000 ppmV/4h
ATE (vapours)	11.000 mg/l/4h
ATE (dust,mist)	1.500 mg/l/4h

2,2',4,4',5,5'-HEXABB (PBB-153) (13C12, 99%) (59080-40-9 (Unlabeled))	
ATE (oral)	500.000 mg/kg bodyweight
ATE (dermal)	1100.000 mg/kg bodyweight

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE EO-5319-A-CS3

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GAMMA-HEXABROMOCYCLODODECANE UNLABELED (25637-99-4)	
LD50 oral rat	> 20000 mg/kg
HEXABROMOBENZENE UNLABELED (87-82-1)	
LD50 oral rat	225 mg/kg
ATE (oral)	225.000 mg/kg bodyweight
ATE (dermal)	1100.000 mg/kg bodyweight
ATE (gases)	4500.000 ppmV/4h
ATE (vapours)	11.000 mg/l/4h
ATE (dust,mist)	1.500 mg/l/4h
HEXABROMOBENZENE (13C6, 99%) (87-82-1 (Unlabeled))	
LD50 oral rat	225 mg/kg
ATE (oral)	225.000 mg/kg bodyweight
ATE (dermal)	1100.000 mg/kg bodyweight
ATE (gases)	4500.000 ppmV/4h
ATE (vapours)	11.000 mg/l/4h
ATE (dust,mist)	1.500 mg/l/4h
1,2,3,4-TETRACHLORODIBENZO-P-DIOXIN (13C12, 99%) (116865-58-8)	
LD50 oral	0.013 mg/kg
LD50 dermal	0.275 mg/kg
ATE (dermal)	5.000 mg/kg bodyweight
N-NONANE UNLABELED (111-84-2)	
LC50 inhalation rat (mg/l)	23760 mg/m ³ male - 4 h
LC50 inhalation rat (ppm)	3200 ppm/4h
ATE (gases)	3200.000 ppmV/4h
ATE (vapours)	11.000 mg/l/4h
ATE (dust,mist)	23.760 mg/l/4h
1,2-BIS(PENTABROMOPHENYL)ETHANE UNLABELED (84852-53-9)	
LD50 oral rat	2000 mg/kg
LD50 oral	> 5000 mg/kg
LD50 dermal rabbit	> 5000 mg/kg
ATE (oral)	2000.000 mg/kg bodyweight
1,2-BIS (PENTABROMOPHENYL) ETHANE (13C14, 99%) (84852-53-9 (Unlabeled))	
LD50 oral rat	> 2000 mg/kg
LD50 dermal rabbit	> 5000 mg/kg
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE UNLABELED (37853-59-1)	
LD50 oral rat	> 10 g/kg
LD50 dermal rabbit	> 10 g/kg
LC50 inhalation rat (mg/l)	36.68 mg/l
ATE (oral)	500.000 mg/kg bodyweight
ATE (vapours)	36.680 mg/l/4h
ATE (dust,mist)	36.680 mg/l/4h
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE (13C12, 99%) (37853-59-1)	
LD50 oral rat	> 10 g/kg
LD50 dermal rabbit	> 10 g/kg
LC50 inhalation rat (mg/l)	36.68 mg/l
ATE (oral)	500.000 mg/kg bodyweight
ATE (vapours)	36.680 mg/l/4h
ATE (dust,mist)	36.680 mg/l/4h

Skin corrosion/irritation	: Causes skin irritation. Skin - rat - Skin irritation - Draize test
Serious eye damage/irritation	: Causes serious eye irritation. No data available
Respiratory or skin sensitisation	: Not available No data available

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE EO-5319-A-CS3

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Germ cell mutagenicity	: Not available
Carcinogenicity	: Not classified
Reproductive toxicity	: Not available
Specific target organ toxicity (single exposure)	: May cause drowsiness or dizziness. May cause drowsiness or dizziness.
Specific target organ toxicity (repeated exposure)	: Not classified No data available
Aspiration hazard	: May be fatal if swallowed and enters airways.
Potential Adverse human health effects and symptoms	: Harmful if inhaled.
Symptoms/injuries after inhalation	: Danger of serious damage to health by prolonged exposure through inhalation. Harmful if inhaled. May cause drowsiness or dizziness.
Symptoms/injuries after skin contact	: Causes skin irritation.
Symptoms/injuries after eye contact	: Causes eye irritation.
Symptoms/injuries after ingestion	: May be fatal if swallowed and enters airways.

SECTION 12: Ecological information

12.1. Toxicity

GAMMA-HEXABROMOCYCLODODECANE UNLABELED (25637-99-4)	
LC50 fishes 1	0.003 mg/l Oncorhynchus mykiss(rainbow trout) - 96 h
EC50 Daphnia 1	> 3.2 mg/l Daphnia - 48 h
ErC50 (algae)	0.009 mg/l Algae - 72 h
1,2-BIS(PENTABROMOPHENYL)ETHANE UNLABELED (84852-53-9)	
LC50 fishes 1	>10,000 mg/l - 96h
ErC50 (algae)	> 10,000 mg/l - Daphnia magna (Waterflea)- 48h
1,2-BIS (PENTABROMOPHENYL) ETHANE (13C14, 99%) (84852-53-9 (Unlabeled))	
LC50 fishes 1	> 11000 mg/l 96 h
ErC50 (algae)	> 10000 mg/l Daphnia magna (Waterflea)- 48h
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE UNLABELED (37853-59-1)	
LC50 fishes 1	> 3160 mg/l Bluegill - 24 h
LC50 other aquatic organisms 1	230 mg/l Oryzias latipes - 48 h
LC50 fish 2	> 3160 mg/l Rainbow trout - 24 h
LC50 other aquatic organisms 2	5.573 mg/l Mysid shrimp - 96 h
ErC50 (algae)	33.66 mg/l Algae - 96 h
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE (13C12, 99%) (37853-59-1)	
LC50 fishes 1	> 3160 mg/l Bluegill - 24 h
LC50 other aquatic organisms 1	230 mg/l Oryzias latipes - 48 h
LC50 fish 2	> 3160 mg/l Rainbow trout - 24 h
LC50 other aquatic organisms 2	5.573 mg/l Mysid shrimp - 96 h
ErC50 (algae)	33.66 mg/l Algae - 96 h

12.2. Persistence and degradability

2,2',3,4,4',5,5',6-OCTABDE (BDE-203) UNLABELED (337513-72-1)	
Persistence and degradability	Not available.
2,2',3,3',4,4',6,6'-OCTABDE (BDE-197) UNLABELED (117964-21-3)	
Persistence and degradability	Not available.
2,2',3,3',4,5,5',6,6'-NONABDE (BDE-208) UNLABELED (437701-78-5)	
Persistence and degradability	Not available.
2,2',3,3',4,4',5,6,6'-NONABDE (BDE-207) UNLABELED (437701-79-6)	
Persistence and degradability	Not available.
2,2',3,3',4,4',5,5',6-NONABDE (BDE-206) UNLABELED (63387-28-0)	
Persistence and degradability	Not available.

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE EO-5319-A-CS3

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2,2',3,4,4'-PENTABDE (BDE-85) UNLABELED (182346-21-0)	
Persistence and degradability	Not available.
2,2',4,4',5,5'-HEXABB (PBB-153) UNLABELED (59080-40-9)	
Persistence and degradability	No data available.
2,2',4,4',5,5'-HEXABB (PBB-153) (13C12, 99%) (59080-40-9 (Unlabeled))	
Persistence and degradability	No data available.
2,2',3,3',4,4',5,6,6'-NONABDE (BDE-207) (13C12, 99%) (437701-79-6 (Unlabeled))	
Persistence and degradability	Not available.
3,3',4,4'-TETRABDE (BDE-77) (13C12, 99%) (93703-48-1 (Unlabeled))	
Persistence and degradability	Not available.
2,2',3,4,4',6-HEXABDE (BDE-139) (13C12, 99%) (488710-25-4)	
Persistence and degradability	Not available.
HEXABROMOBENZENE UNLABELED (87-82-1)	
Persistence and degradability	Not available.
2,2',3,3',4,4',5,6'-OCTABDE (BDE-196) UNLABELED	
Persistence and degradability	Not available.
2,2',3,3',4,4',6,6'-OCTABDE (BDE-197) (13C12, 99%) (117964-21-3 (Unlabeled))	
Persistence and degradability	Not available.
2,2',3,3',4,5,5',6,6'-NONABDE (BDE-208) (13C12, 99%) (437701-78-5 (Unlabeled))	
Persistence and degradability	Not available.
2,2',3,4,4',5,5',6-OCTABDE (BDE-203) (13C12, 99%) (337513-72-1 (Unlabeled))	
Persistence and degradability	Not available.
2,2',3,3',4,4',5,5',6-NONABDE (BDE-206) (13C12, 99%) (63387-28-0 (Unlabeled))	
Persistence and degradability	Not available.
HEXABROMOBENZENE (13C6, 99%) (87-82-1 (Unlabeled))	
Persistence and degradability	Not available.
GAMMA-HEXABROMOCYCLODODECANE (13C12, 99%) (25637-99-4 (Unlabeled))	
Persistence and degradability	May cause long-term adverse effects in the environment.
1,2,3,4-TETRACHLORODIBENZO-P-DIOXIN (13C12, 99%) (116865-58-8)	
Persistence and degradability	May cause long-term adverse effects in the environment.
1,2-BIS(PENTABROMOPHENYL)ETHANE UNLABELED (84852-53-9)	
Persistence and degradability	Not available.
1,2-BIS (PENTABROMOPHENYL) ETHANE (13C14, 99%) (84852-53-9 (Unlabeled))	
Persistence and degradability	Not available.
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE UNLABELED (37853-59-1)	
Persistence and degradability	Biodegradability: Result: - Not readily biodegradable.
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE (13C12, 99%) (37853-59-1)	
Persistence and degradability	Biodegradability: Result: - Not readily biodegradable.
12.3. Bioaccumulative potential	
CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE	
Log Pow	5.65
Bioaccumulative potential	Indication of bioaccumulation.
2,2',3,4,4',5,5',6-OCTABDE (BDE-203) UNLABELED (337513-72-1)	
Bioaccumulative potential	Not available.
2,2',3,3',4,4',6,6'-OCTABDE (BDE-197) UNLABELED (117964-21-3)	
Bioaccumulative potential	Not available.
2,2',3,3',4,5,5',6,6'-NONABDE (BDE-208) UNLABELED (437701-78-5)	
Bioaccumulative potential	Not available.

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE EO-5319-A-CS3

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2,2',3,3',4,4',5,6'-NONABDE (BDE-207) UNLABELED (437701-79-6)	
Bioaccumulative potential	Not available.
2,2',3,3',4,4',5,5',6'-NONABDE (BDE-206) UNLABELED (63387-28-0)	
Bioaccumulative potential	Not available.
2,2',3,4,4'-PENTABDE (BDE-85) UNLABELED (182346-21-0)	
Bioaccumulative potential	Not available.
2,2',4,4',5,5'-HEXABB (PBB-153) UNLABELED (59080-40-9)	
Bioaccumulative potential	No data available.
2,2',4,4',5,5'-HEXABB (PBB-153) (13C12, 99%) (59080-40-9 (Unlabeled))	
Bioaccumulative potential	No data available.
2,2',3,3',4,4',5,6'-NONABDE (BDE-207) (13C12, 99%) (437701-79-6 (Unlabeled))	
Bioaccumulative potential	Not available.
3,3',4,4'-TETRABDE (BDE-77) (13C12, 99%) (93703-48-1 (Unlabeled))	
Bioaccumulative potential	Not available.
2,2',3,4,4',6'-HEXABDE (BDE-139) (13C12, 99%) (488710-25-4)	
Bioaccumulative potential	Not available.
GAMMA-HEXABROMOCYCLODODECANE UNLABELED (25637-99-4)	
Bioaccumulative potential	Not available.
HEXABROMOBENZENE UNLABELED (87-82-1)	
Log Pow	6.278
Bioaccumulative potential	Not available.
2,2',3,3',4,4',5,6'-OCTABDE (BDE-196) UNLABELED	
Bioaccumulative potential	Not available.
2,2',3,3',4,4',6,6'-OCTABDE (BDE-197) (13C12, 99%) (117964-21-3 (Unlabeled))	
Bioaccumulative potential	Not available.
2,2',3,3',4,5,5',6,6'-NONABDE (BDE-208) (13C12, 99%) (437701-78-5 (Unlabeled))	
Bioaccumulative potential	Not available.
2,2',3,4,4',5,5',6-OCTABDE (BDE-203) (13C12, 99%) (337513-72-1 (Unlabeled))	
Bioaccumulative potential	Not available.
2,2',3,3',4,4',5,5',6-NONABDE (BDE-206) (13C12, 99%) (63387-28-0 (Unlabeled))	
Bioaccumulative potential	Not available.
HEXABROMOBENZENE (13C6, 99%) (87-82-1 (Unlabeled))	
Log Pow	6.278
Bioaccumulative potential	Not available.
N-NONANE UNLABELED (111-84-2)	
Log Pow	5.65
Bioaccumulative potential	Indication of bioaccumulation.
1,2-BIS(PENTABROMOPHENYL)ETHANE UNLABELED (84852-53-9)	
Bioaccumulative potential	Bioaccumulation is unlikely.
1,2-BIS (PENTABROMOPHENYL) ETHANE (13C14, 99%) (84852-53-9 (Unlabeled))	
Log Kow	3.55
Bioaccumulative potential	Bioaccumulation is unlikely.
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE UNLABELED (37853-59-1)	
Log Pow	3.317
Log Kow	8.9
1,2-BIS (2,4,6-TRIBROMOPHENOXY) ETHANE (13C12, 99%) (37853-59-1)	
Log Pow	3.317
Log Kow	8.9

12.4. Mobility in soil

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE EO-5319-A-CS3

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2,2',3,4,4',5,5',6-OCTABDE (BDE-203) UNLABELED (337513-72-1)	
Ecology - soil	Not available.
2,2',3,3',4,4',6,6'-OCTABDE (BDE-197) UNLABELED (117964-21-3)	
Ecology - soil	Not available.
2,2',3,3',4,5,5',6,6'-NONABDE (BDE-208) UNLABELED (437701-78-5)	
Ecology - soil	Not available.
2,2',3,3',4,4',5,6,6'-NONABDE (BDE-207) UNLABELED (437701-79-6)	
Ecology - soil	Not available.
2,2',3,3',4,4',5,5',6-NONABDE (BDE-206) UNLABELED (63387-28-0)	
Ecology - soil	Not available.
2,2',3,4,4'-PENTABDE (BDE-85) UNLABELED (182346-21-0)	
Ecology - soil	Not available.
2,2',4,4',5,5'-HEXABB (PBB-153) UNLABELED (59080-40-9)	
Ecology - soil	No data available.
2,2',4,4',5,5'-HEXABB (PBB-153) (13C12, 99%) (59080-40-9 (Unlabeled))	
Ecology - soil	No data available.
2,2',3,3',4,4',5,6,6'-NONABDE (BDE-207) (13C12, 99%) (437701-79-6 (Unlabeled))	
Ecology - soil	Not available.
3,3',4,4'-TETRABDE (BDE-77) (13C12, 99%) (93703-48-1 (Unlabeled))	
Ecology - soil	Not available.
2,2',3,4,4',6-HEXABDE (BDE-139) (13C12, 99%) (488710-25-4)	
Ecology - soil	Not available.
GAMMA-HEXABROMOCYCLODODECANE UNLABELED (25637-99-4)	
Ecology - soil	Not available.
HEXABROMOBENZENE UNLABELED (87-82-1)	
Ecology - soil	Not available.
2,2',3,3',4,4',5,6'-OCTABDE (BDE-196) UNLABELED	
Ecology - soil	Not available.
2,2',3,3',4,4',6,6'-OCTABDE (BDE-197) (13C12, 99%) (117964-21-3 (Unlabeled))	
Ecology - soil	Not available.
2,2',3,3',4,5,5',6,6'-NONABDE (BDE-208) (13C12, 99%) (437701-78-5 (Unlabeled))	
Ecology - soil	Not available.
2,2',3,4,4',5,5',6-OCTABDE (BDE-203) (13C12, 99%) (337513-72-1 (Unlabeled))	
Ecology - soil	Not available.
2,2',3,3',4,4',5,5',6-NONABDE (BDE-206) (13C12, 99%) (63387-28-0 (Unlabeled))	
Ecology - soil	Not available.
HEXABROMOBENZENE (13C6, 99%) (87-82-1 (Unlabeled))	
Ecology - soil	Not available.
1,2-BIS(PENTABROMOPHENYL)ETHANE UNLABELED (84852-53-9)	
Ecology - soil	Not available.
1,2-BIS (PENTABROMOPHENYL) ETHANE (13C14, 99%) (84852-53-9 (Unlabeled))	
Ecology - soil	Not available.

12.5. Results of PBT and vPvB assessment

DECABDE (BDE-209) UNLABELED (1163-19-5)	
This substance/mixture meets the PBT criteria of REACH, annex XIII.	
This substance/mixture meets the vPvB criteria of REACH, annex XIII.	
GAMMA-HEXABROMOCYCLODODECANE UNLABELED (25637-99-4)	
This substance/mixture meets the PBT criteria of REACH, annex XIII.	

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GAMMA-HEXABROMOCYCLODODECANE UNLABELED (25637-99-4)

This substance/mixture does not meet the vPvB criteria of REACH, annex XIII.

12.6. Other adverse effects

Other adverse effects : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste) : Waste materials should be disposed of under conditions which meet Federal, State, and Local environmental control regulations.

Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations.

SECTION 14: Transport information

In accordance with ADR / RID / ADNR / IMDG / ICAO / IATA

14.1. UN number

UN-No.(DOT) : 1920
DOT NA no. UN1920

14.2. UN proper shipping name

DOT Proper Shipping Name : Nonanes
Department of Transportation (DOT) Hazard Classes : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
Hazard labels (DOT) : 3 - Flammable liquid



Packing group (DOT) : III - Minor Danger
DOT Special Provisions (49 CFR 172.102) : B1 - If the material has a flash point at or above 38 C (100 F) and below 93 C (200 F), then the bulk packaging requirements of 173.241 of this subchapter are applicable. If the material has a flash point of less than 38 C (100 F), then the bulk packaging requirements of 173.242 of this subchapter are applicable.
IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672).
T2 - 1.5 178.274(d)(2) Normal..... 178.275(d)(3)
TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = $97 / (1 + a (tr - tf))$ Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.
DOT Packaging Exceptions (49 CFR 173.xxx) : 150
DOT Packaging Non Bulk (49 CFR 173.xxx) : 203
DOT Packaging Bulk (49 CFR 173.xxx) : 242
Marine pollutant : No

14.3. Additional information

Other information : No supplementary information available.

Overland transport

Packing group (ADR) : III
Class (ADR) : 3 - Flammable liquids
Hazard identification number (Kemler No.) : 30
Classification code (ADR) : F1
Danger labels (ADR) : 3 - Flammable liquids



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Orange plates :

30
1920

Tunnel restriction code : D/E
Limited quantities (ADR) : 5L
EAC code : 3Y
Excepted quantities (ADR) : E1

Transport by sea

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.
MFAG-No : 128

Air transport

DOT Quantity Limitations Passenger aircraft/rail : 60 L
(49 CFR 173.27)
DOT Quantity Limitations Cargo aircraft only (49 : 220 L
CFR 175.75)

14.4. Environmental hazards

Other information : No supplementary information available.

14.5. Special precautions for user

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

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE

SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard
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1,2,3,4-TETRACHLORODIBENZO-P-DIOXIN (13C12, 99%) (116865-58-8)

Not listed on the United States TSCA (Toxic Substances Control Act) inventory

N-NONANE UNLABELED (111-84-2)

SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard
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15.2. International regulations

CANADA

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE

Listed on the Canadian DSL (Domestic Substances List) inventory.

15.2.1. National regulations

No additional information available

15.3. US State regulations

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE()

State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - Pennsylvania - RTK (Right to Know) List U.S. - New Jersey - Right to Know Hazardous Substance List This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
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2,2',3,3',4,4',5,6'-OCTABDE (BDE-196) UNLABELED

U.S. - Massachusetts - Right To Know List
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - New Jersey - Right to Know Hazardous Substance List
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

CDC BFR CALIBRATION STANDARD CS3 (UNLABELED/13C12, 99%) IN NONANE EO-5319-A-CS3

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1,2,3,4-TETRACHLORODIBENZO-P-DIOXIN (13C12, 99%) (116865-58-8)

U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
WARNING! This product contains a chemical known by the state of California to cause birth defects or other reproductive harm.

N-NONANE UNLABELED (111-84-2)

U.S. - Massachusetts - Right To Know List
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - New Jersey - Right to Know Hazardous Substance List
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SECTION 16: Other information

Other information : This product is not radioactive. The data given for this product are those of the corresponding unlabeled compound, unless specifically indicated otherwise. Health and safety data for labeled compounds are generally not available, but are assumed to be similar or identical to the corresponding unlabeled compound.

Full text of R-, H- and EUH-phrases::

Acute Tox. 1 (Dermal)	Acute toxicity (dermal), Category 1
Acute Tox. 3 (Oral)	Acute toxicity (oral), Category 3
Acute Tox. 4 (Dermal)	Acute toxicity (dermal), Category 4
Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Acute Tox. 4 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 4
Acute Tox. 4 (Inhalation:vapour)	Acute toxicity (inhalation:vapour) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Acute 1	Hazardous to the aquatic environment — Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment — Chronic Hazard, Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment — Chronic Hazard, Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3
Aquatic Chronic 4	Hazardous to the aquatic environment — Chronic Hazard, Category 4
Asp. Tox. 1	Aspiration hazard, Category 1
Carc. 1A	Carcinogenicity, Category 1A
Carc. 1A	Carcinogenicity (inhalation) Category 1A
Carc. 1B	Carcinogenicity, Category 1B
Carc. 2	Carcinogenicity, Category 2
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Flam. Liq. 3	Flammable liquids, Category 3
Lact.	Reproductive toxicity, Additional category, Effects on or via lactation
Muta. 2	Germ cell mutagenicity, Category 2
Repr. 2	Reproductive toxicity, Category 2
Skin Irrit. 2	Skin corrosion/irritation, Category 2
Skin Sens. 1	Sensitisation — Skin, category 1
STOT RE 1	Specific target organ toxicity — Repeated exposure, Category 1
STOT RE 2	Specific target organ toxicity — Repeated exposure, Category 2
STOT SE 2	Specific target organ toxicity — Single exposure, Category 2
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Narcosis
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation
H226	Flammable liquid and vapour
H301	Toxic if swallowed
H302	Harmful if swallowed
H304	May be fatal if swallowed and enters airways
H310	Fatal in contact with skin
H312	Harmful in contact with skin
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H319	Causes serious eye irritation
H332	Harmful if inhaled
H335	May cause respiratory irritation

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H336	May cause drowsiness or dizziness
H341	Suspected of causing genetic defects
H350	May cause cancer
H350i	May cause cancer by inhalation
H351	Suspected of causing cancer
H361	Suspected of damaging fertility or the unborn child
H362	May cause harm to breast-fed children
H371	May cause damage to organs
H372	Causes damage to organs through prolonged or repeated exposure
H373	May cause damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects
H413	May cause long lasting harmful effects to aquatic life
R10	Flammable
R11	Highly flammable
R20	Harmful by inhalation
R20/21/22	Harmful by inhalation, in contact with skin and if swallowed
R21	Harmful in contact with skin
R22	Harmful if swallowed
R25	Toxic if swallowed
R27	Very toxic in contact with skin
R33	Danger of cumulative effects
R36	Irritating to eyes
R36/37/38	Irritating to eyes, respiratory system and skin
R37	Irritating to respiratory system
R38	Irritating to skin
R40	Limited evidence of a carcinogenic effect
R41	Risk of serious damage to eyes
R43	May cause sensitisation by skin contact
R45	May cause cancer
R48	Danger of serious damage to health by prolonged exposure
R48/20/21/22	Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed
R49	May cause cancer by inhalation
R50	Very toxic to aquatic organisms
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R53	May cause long-term adverse effects in the aquatic environment
R62	Possible risk of impaired fertility
R63	Possible risk of harm to the unborn child
R65	Harmful: may cause lung damage if swallowed
R67	Vapours may cause drowsiness and dizziness
R68	Possible risk of irreversible effects
F	Highly flammable
N	Dangerous for the environment
T	Toxic
T+	Very toxic
Xi	Irritant
Xn	Harmful

NFPA health hazard

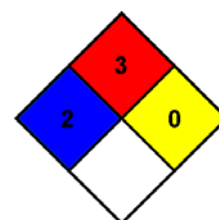
: 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard

: 3 - Liquids and solids that can be ignited under almost all ambient conditions.

NFPA reactivity

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health

: 2 Moderate Hazard - Temporary or minor injury may occur

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Flammability : 3 Serious Hazard
Physical : 0 Minimal Hazard

CIL Mixture SDS

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product