



# MATERIAL SAFETY DATA SHEET

## 1. Product and Company Identification

<b>Product identifier</b>	<b>FLEETCOOL DCA-2 LIQUID</b>
<b>Other means of identification</b>	
<b>MSDS number</b>	LT16572
<b>Product code</b>	DCA 30L (1 Pint / 470 mL); DCA 35L (64 ounce / 1.89 L); DCA 40L (1 gallon / 3.785 L); DCA 45L (5 gallon / 18.9 L Pail); DCA 50L (55 gallon / 208 L Drum)
<b>Product use</b>	Additive for low silicate antifreeze.
<b>Chemical family</b>	Mixture of: Water; Sodium salts
<b>Manufacturer</b>	
<b>Company name</b>	Cummins Filtration
<b>Address</b>	1200 Fleetguard Road Cookeville, TN, U.S.A. 38506
<b>Telephone</b>	(931) 526 9551
<b>Website</b>	www.cumminsfiltration.com
<b>E-Mail</b>	fleetmaster.us@cummins.com
<b>Supplier information</b>	Refer to Manufacturer
<b>Emergency phone number</b>	Chemtrec 1-800-424-9300 (Within Continental U.S.); Chemtrec 703-527-3887 (Outside U.S.).

## 2. Hazard(s) Identification

<b>Emergency overview</b>	Blue liquid. Little or no odour. DANGER! Contains a strong oxidizer. Contact with combustible material may cause fire. May be harmful or fatal if swallowed. May be harmful if inhaled. May cause respiratory irritation. May cause severe irritation to the mouth, throat and stomach. Possible severe eye irritation and tissue damage. May cause skin irritation. Contains material which may cause adverse blood system effects. Repeated or prolonged exposure may result in kidney effects. Possible reproductive hazard. Contains material that may cause adverse reproductive effects, based on animal data.
<b>Potential health effects</b>	
<b>Routes of exposure</b>	
<b>Routes of entry skin &amp; eye</b>	YES
<b>Routes of entry skin absorption</b>	YES
<b>Routes of entry inhalation</b>	YES
<b>Routes of entry ingestion</b>	YES
<b>Target organs</b>	Eyes, skin, respiratory system, central nervous system, blood system, liver, brain and kidneys.
<b>Chronic effects</b>	Chronic skin contact with low concentrations may cause dermatitis. Repeated or prolonged overexposure may cause anemia and kidney effects.
<b>Most important symptoms/effects, acute and delayed</b>	Causes skin irritation. Contact may cause redness, swelling and a painful sensation. Direct eye contact may produce severe irritation with possible eye damage. Symptoms may include severe pain, tearing, redness, swelling and blurred vision. May cause irreversible eye damage. May cause respiratory irritation. Symptoms may include upper respiratory irritation, coughing and breathing difficulties. May be harmful or fatal if swallowed. May cause severe irritation and corrosive damage in the mouth, throat and stomach. Symptoms may include abdominal pain, vomiting, burns, perforations and bleeding. May result in unconsciousness and possibly death. May damage fertility or the unborn child. Contains chemicals that may cause male reproductive toxicity and developmental toxicity. This product contains: Sodium tetraborate. Repeated or prolonged overexposure may cause anemia and kidney effects.

Contains: Sodium nitrite; Sodium nitrate. Ingestion of large amounts of nitrites or nitrates may affect oxygen transport in the blood and blood system, causing methemoglobinemia. Methemoglobinemia, characterized by blue-black coloration of the lips, tongue, and the mucous membranes, with the skin becoming slate gray in color.

**Potential environmental effects** Harmful to aquatic life with long lasting effects. Avoid release to the environment. See ECOLOGICAL INFORMATION, Section 12.

### 3. Composition/information on ingredients

#### Mixture

Chemical name	CAS #	Percent
Sodium nitrite	7632-00-0	3.0 - 6.0
Disodium tetraborate, anhydrous	1330-43-4	3.0 - 6.0
Sodium nitrate	7631-99-4	1.0 - 5.0
Sodium metasilicate	6834-92-0	1.0 - 3.0
Sodium 2-mercaptobenzothiazole	2492-26-4	0.1 - 1.0
Sodium tolytriazole	64665-57-2	0.1 - 0.5

### 4. First Aid Measures

#### First aid procedures

<b>Inhalation</b>	IF INHALED: Remove person to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen by qualified medical personnel only. If breathing stopped, begin artificial respiration. Get medical attention.
<b>Skin contact</b>	Immediately flush skin with running water for at least 15 minutes, while removing contaminated clothing. Get medical attention. Wash contaminated clothing before reuse.
<b>Eye contact</b>	Immediately flush eyes with running water for at least 20 minutes. Seek immediate medical attention/advice.
<b>Ingestion</b>	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Never give anything by mouth to a person who is unconscious or is having convulsions Get medical attention immediately.

**Notes to physician** Immediate medical attention is required. Causes serious eye damage. Provide general supportive measures and treat symptomatically.

**General Information** Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

### 5. Fire Fighting Measures

**Flammable properties** Not flammable by WHMIS criteria.

#### Extinguishing media

<b>Suitable extinguishing media</b>	Use water spray to fight fires.
<b>Unsuitable extinguishing media</b>	Use chemical extinguishing agents with caution. Some chemical extinguishing agents may react with this material.

#### Protection of firefighters

**Specific hazards arising from the chemical** The pressure in sealed containers can increase under the influence of heat.

**Protective equipment for firefighters** Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode.

**Fire fighting equipment/instructions** Move containers from fire area if safe to do so. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. Dike for water control.



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<b>Specific methods</b>	Use standard firefighting procedures and consider the hazards of other involved materials.
<b>Explosion data</b>	
<b>Sensitivity to static discharge</b>	Not expected to be sensitive to static discharge.
<b>Sensitivity to mechanical impact</b>	Not expected to be sensitive to mechanical impact.
<b>Hazardous combustion products</b>	Nitrogen oxides (NOx); Sodium oxides; Oxygen; Boron and compounds; Carbon oxides; Silicon oxides.
<b>General fire hazards</b>	Not classified as flammable. However, substance may be considered a strong oxidizer. This product contains Sodium nitrite / Sodium nitrate, which enhance the burning rate of other materials. Contact with combustible material may cause fire.

### 6. Accidental Release Measures

<b>Personal precautions</b>	Keep people away from and upwind of spill/leak. Restrict access to area until completion of clean-up. Wear appropriate protective equipment. Refer to protective measures listed in sections 7 and 8.
<b>Environmental precautions</b>	Prevent product from entering drains, sewers, waterways and soil.
<b>Methods and materials for containment and cleaning up</b>	Ventilate the area. Remove all sources of ignition. Prevent further leakage or spillage if safe to do so. For spilled liquids: absorb spill with inert, non-combustible material such as sand, then place into suitable containers. Pick up and transfer to properly labelled containers. Contaminated absorbent material may pose the same hazards as the spilled product. For large spills on surfaces other than pavement (e.g. soil or sand), spills may be handled by digging up and removing the affected surface and placing it in approved containers. Contact the proper local authorities. Do not use combustible absorbents, such as sawdust.
<b>Other information</b>	Clean up in accordance with all applicable regulations.

### 7. Handling and Storage

<b>Handling</b>	Use only outdoors or in a well-ventilated area. Wear suitable protective equipment during handling. Avoid breathing mist or vapours. Avoid contact with skin, eyes and clothing. Keep away from extreme heat and direct flame. Keep away from incompatibles. Keep away from combustible material. Keep containers tightly closed when not in use. Wash thoroughly after handling. Empty containers retain residue (liquid and/or vapour) and can be dangerous.
<b>Storage</b>	Store in cool/well-ventilated place. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. Do not store near any incompatible materials (see Section 10).

### 8. Exposure Controls / Personal Protection

#### Occupational exposure limits

#### US. ACGIH Threshold Limit Values

	Type	Value
Disodium tetraborate, anhydrous (CAS 1330-43-4)	STEL	6 mg/m <sup>3</sup> (inhalable fraction, listed under Borate compounds, inorganic)
	TWA	2 mg/m <sup>3</sup> (inhalable fraction, listed under Borate compounds, inorganic)

#### Biological limit values

No biological exposure limits noted for the ingredient(s).



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### Engineering controls

Use only outdoors or in a well-ventilated area. Apply technical measures to comply with the occupational exposure limits. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. In case of insufficient ventilation wear suitable respiratory equipment.

### Personal protective equipment

#### Eye / face protection

Wear eye/face protection. Chemical splash goggles are recommended. A full face shield may also be necessary.

#### Skin protection

Wear protective gloves. The suitability for a specific workplace should be discussed with the producers of the protective gloves. Wear a chemically resistant apron and long sleeves when dispensing, to prevent skin contact.

#### Respiratory protection

If airborne concentrations are above the permissible exposure limit or are not known, use NIOSH-approved respirators. Respirators should be selected based on the form and concentration of contaminants in air, and in accordance with CSA Z94.4-02. Advice should be sought from respiratory protection specialists.

#### Hand protection

Ensure that eyewash stations and safety showers are close to the workstation location. Other equipment may be required depending on workplace standards.

## 9. Physical and chemical properties

### Appearance

#### Physical state

Liquid.

#### Form

Thin liquid.

#### Colour

blue

### Odour

Little or no odour.

### Odour threshold

N/Av

### pH

11.3 - 12

### Melting point /freezing point

N/Av

### Initial boiling point and boiling range

100°C (212°F)

### Flash point

111°C (232°F)

Cleveland Open Cup

### Evaporation rate

N/Av

### Flammability (solid, gas)

Not applicable.

### Lower flammability/explosive limit

N/Av

### Upper flammability/explosive limit

N/Av

### Vapour pressure

760 mmHg @ 100°C (212°F)

### Vapour density

N/Av

### Relative density

1.14 - 1.16

### Solubility(ies)

#### Other solubility(ies)

N/Av

#### Solubility (water)

Complete

### Partition coefficient (n-octanol/water)

N/Av

### Auto-ignition temperature

N/Av

### Decomposition temperature

N/Av

### Viscosity

N/Av

### Other information

#### Explosive properties

Not explosive

#### Oxidizing properties

This product was tested in accordance with Test O.2 - Test for Oxidizing liquids, in accordance with the UN Manual on Tests and Criteria. At a 1:1 ratio of sample/cellulose (2.5 g of the liquid and 2.5 g of dried cellulose) tested, the maximum pressure rise was < 2070 kPa (300 psi) or the pressure rise time was > the mean pressure rise time for the PGIII reference standard. The material is therefore, not considered to be an oxidizing liquid.



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**Specific gravity** 1.14 - 1.16  
**VOC** N/Av  
**Volatilities %** N/Av  
**Other physical/chemical data** Alkali reserve: 1.525 g NaOH

## 10. Stability and reactivity

**Reactivity** Not normally reactive. However, substance may be considered a strong oxidizer. Contact with combustible material may cause fire.  
**Chemical stability** Stable under the recommended storage and handling conditions prescribed.  
**Possibility of hazardous reactions** No dangerous reaction known under conditions of normal use. Hazardous polymerization does not occur.  
**Conditions to avoid** Direct sources of heat. Do not use in areas without adequate ventilation. Avoid contact with incompatible materials.  
**Incompatible materials** Strong acids, strong oxidizing agent (e.g. Chlorides, peroxides), reducing agents (e.g. cyanides, metal hydrides). Avoid organic materials. Combustible material.  
**Hazardous decomposition products** None known, refer to hazardous combustion products in Section 5.

## 11. Toxicological information

### Toxicological data

Components	Species	Test Results
Sodium nitrite		
<b>Acute</b>		
<i>Dermal</i>		
LD50	Rabbit	N/Av
<i>Inhalation</i>		
LC50	Rat	5.5 mg/L (dust)
<i>Oral</i>		
LD50	Rat	180 mg/kg
Disodium tetraborate, anhydrous		
<b>Acute</b>		
<i>Dermal</i>		
LD50	Rabbit	> 2000 mg/kg (No mortality)
<i>Inhalation</i>		
LC50	Rat	> 2.04 mg/L (dust) (No mortality)
<i>Oral</i>		
LD50	Rat	3225 - 5560 mg/kg
Sodium nitrate		
<b>Acute</b>		
<i>Dermal</i>		
LD50	Rabbit	> 5000 mg/kg
<i>Inhalation</i>		
LC50	Rat	N/Av
<i>Oral</i>		
LD50	Rat	1267 mg/kg
Sodium metasilicate		
<b>Acute</b>		
<i>Dermal</i>		
LD50	Rabbit	> 5000 mg/kg (No mortality)
<i>Inhalation</i>		
LC50	Rat	> 2.06 mg/L (mist) (No mortality)

<i>Oral</i>			
LD50	Rat		1152 - 1349 mg/kg
Sodium 2-mercaptobenzothiazole			
<b>Acute</b>			
<i>Dermal</i>			
LD50	Rabbit		> 7940 mg/kg
<i>inhalation</i>			
LC50	Rat		N/Av
<i>Oral</i>			
LD50	Rat		2100 mg/kg
Sodium tolytriazole			
<b>Acute</b>			
<i>Dermal</i>			
LD50	Rabbit		> 2000 mg/kg (No mortality)
<i>inhalation</i>			
LC50	Rat		N/Av
<i>Oral</i>			
LD50	Rat		735 - 1980 mg/kg (50% solution)

**Acute effects**

Causes skin irritation. Causes serious eye damage. Severe respiratory irritant. May cause severe irritation and corrosive damage in the mouth, throat and stomach. See data above for individual ingredient acute toxicity data.

**Senitization**

Not expected to be a skin or respiratory sensitizer.

**Chronic effects**

Chronic skin contact with low concentrations may cause dermatitis. Repeated or prolonged overexposure may cause anemia and kidney effects.

**Carcinogenicity**

Not known to be carcinogenic.  
No components are listed as carcinogens by ACGIH, IARC, OSHA or NTP.

**Skin corrosion/irritation**

May cause moderate skin irritation.

**Serious eye damage/irritation**

Causes eye damage.

**Mutagenicity**

Contains no ingredient above reportable levels that is known to cause mutations in reproductive (germ) and/or non-reproductive cells (somatic).

**Reproductive effects**

May damage fertility or the unborn child. Contains: Disodium tetraborate, anhydrous. The data regarding subchronic and chronic oral exposure to boric acid or borax (Disodium tetraborate, anhydrous) in laboratory animals have demonstrated reproductive toxicity. Available animal data indicates that this substance has toxic effects on the male reproductive tract. Testicular lesions have been observed in rats, mice, and dogs administered boric acid or borax in food or drinking-water (INTERNATIONAL PROGRAMME ON CHEMICAL SAFETY Environmental Health Criteria document # 204).

**Teratogenicity**

Contains: Disodium tetraborate, anhydrous. Sodium tetraborate has been investigated as a developmental hazard.

**Most important symptoms/effects, acute and delayed**

Causes skin irritation. Contact may cause redness, swelling and a painful sensation. Direct eye contact may produce severe irritation with possible eye damage. Symptoms may include severe pain, tearing, redness, swelling and blurred vision. May cause irreversible eye damage. May cause respiratory irritation. Symptoms may include upper respiratory irritation, coughing and breathing difficulties. May be harmful or fatal if swallowed. May cause severe irritation and corrosive damage in the mouth, throat and stomach. Symptoms may include abdominal pain, vomiting, burns, perforations and bleeding. May result in unconsciousness and possibly death. May damage fertility or the unborn child. Contains chemicals that may cause male reproductive toxicity and developmental toxicity. This product contains: Sodium tetraborate. Repeated or prolonged overexposure may cause anemia and kidney effects.

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Contains: Sodium nitrite; Sodium nitrate. Ingestion of large amounts of nitrites or nitrates may affect oxygen transport in the blood and blood system, causing methemoglobinemia. Methemoglobinemia, characterized by blue-black coloration of the lips, tongue, and the mucous membranes, with the skin becoming slate gray in color.

**Further information**

None known or reported by the manufacturer.

### 12. Ecological information

<b>Ecotoxicity data:</b>				
Components	CAS No	Toxicity to Fish		
		LC50 / 96h	NOEC / 21 day	M Factor
Sodium nitrite	7632-00-0	0.54 mg/L (Rainbow trout)	N/Av	1
Disodium tetraborate, anhydrous	1330-43-4	79.7 mg/L (Fathead minnow) (Read-across)	6.4 mg/L/34 days (Zebra fish) (Read-across)	None.
Sodium nitrate	7631-99-4	1685 mg/L (Rainbow trout)	97.8 mg/L (Ocellaris clownfish)	None.
Sodium metasilicate	6834-92-0	260 - 310 mg/L (Rainbow trout)	N/Av	None.
Sodium 2-mercaptobenzothiazole	2492-26-4	0.73 mg/L (Rainbow trout)	N/Av	1
Sodium tolytriazole	64665-57-2	25 mg/L (Rainbow trout)	N/Av	None.

Components	CAS No	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
Sodium nitrite	7632-00-0	15.4 mg/L (Daphnia magna)	N/Av	None.
Disodium tetraborate, anhydrous	1330-43-4	91 mg/L Ceriodaphnia (water flea)	10.8 mg/L (Read-across)	None.
Sodium nitrate	7631-99-4	3581 mg/L (Daphnia magna)	N/Av	None.
Sodium metasilicate	6834-92-0	1700 mg/L (Daphnia magna)	N/Av	None.
Sodium 2-mercaptobenzothiazole	2492-26-4	19 mg/L (Daphnia magna)	0.08 mg/L (Read-across)	1
Sodium tolytriazole	64665-57-2	280 mg/L (Daphnia magna)	18.4 mg/L	None.

Components	CAS No	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
Sodium nitrite	7632-00-0	≥ 100 mg/L/72hr (Green algae)	100 mg/L/72hr	None.
Disodium tetraborate, anhydrous	1330-43-4	52.4 mg/L/72hr (Green algae) (Read-across)	17.5 mg/L/72hr (Read-across)	None.
Sodium nitrate	7631-99-4	N/Av	N/Av	None.
Sodium metasilicate	6834-92-0	> 345 mg/L/72hr (Green algae)	160 mg/L/72hr	None.
Sodium 2-mercaptobenzothiazole	2492-26-4	0.4 mg/L/72hr (Green algae)	0.066 mg/L/72hr (Read-across)	1
Sodium tolytriazole	64665-57-2	26.2 mg/L/72hr (Green algae)	10 mg/L/72hr	None.

**Ecotoxicity**

Harmful to aquatic life with long lasting effects. The product contains the following substances which are hazardous for the environment: Sodium nitrite; Sodium mercaptobenzothiazole.

See above for individual ingredient ecotoxicity data.



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## Environmental effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters.

## Aquatic toxicity

No data is available on the product itself.

## Persistence and degradability

No data is available on the product itself.

Contains the following chemicals which are not readily biodegradable: Sodium tetraborate; Sodium metasilicate; Sodium mercaptobenzothiazole; Sodium tolyltriazole.

The following ingredients are considered to be readily biodegradable: sodium nitrite; Sodium nitrate.

Note: Although Sodium nitrite and Sodium nitrate are inorganic materials, in the environment, bacteria oxidise nitrites to nitrates to Nitrogen. Nitrates and nitrites are reduced to nitrogen by and are therefore considered rapidly degradable.

## Bioaccumulation / accumulation

No data is available on the product itself. See the following data for ingredient information.

<u>Components</u>	<u>Partition coefficient n-octanol/water (log Kow)</u>	<u>Bioconcentration factor (BCF)</u>
Sodium nitrite (CAS 7632-00-0)	- 3.7	3.162
Disodium tetraborate, anhydrous (CAS 1330-43-4)	N/Av	121 (algea)
Sodium nitrate (CAS 7631-99-4)	- 0.79	N/Av
Sodium 2-mercaptobenzothiazole (CAS 2492-26-4)	- 0.46	< 8 (common carp)
Sodium tolyltriazole (CAS 64665-57-2)	1.083	N/Av

## Mobility in soil

The product itself has not been tested.

## 13. Disposal consideration

### Disposal instructions

Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of in accordance with local regulations.

### Waste from residues / unused products

Dispose in accordance with all applicable federal, provincial, state and local regulations.

### Contaminated packaging

Empty containers should be taken for local recycling or waste disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

## 14. Transport information

### TDG

Not regulated as dangerous goods

### ICAO/IATA

Not regulated as dangerous goods

### IMDG

Not regulated as dangerous goods

### General information

Appropriate advice on safety must accompany the package.

This product does not meet the criteria for an environmentally hazardous mixture, according to the IMDG Code. See Section 12 for more environmental information.

## 15. Regulatory information





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## Canadian regulations

Canadian Environmental Protection Act (CEPA) information: All ingredients listed appear on the Domestic Substances List (DSL).

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and this MSDS contains all the information required by the CPR.

## WHMIS status

Controlled

## WHMIS classification

Class C (Oxidizing Material)  
Class D1B (Materials Causing Immediate and Serious Toxic Effects, Toxic Material)  
Class D2A (Materials Causing Other Toxic Effects, Very Toxic Material)  
Class D2B (Materials Causing Other Toxic Effects, Toxic Material)

## WHMIS labeling



## International Inventories

TSCA: All listed ingredients appear on the Toxic Substances Control Act (TSCA) inventory.

Components listed below are present on the following International Inventory lists:

<u>Ingredients</u>	<u>CAS #</u>	<u>European EINECS</u>	<u>Australia AICS</u>	<u>Philippines PICCS</u>	<u>Japan ENCS</u>	<u>Korea KECI/KECL</u>	<u>China IECSC</u>	<u>NewZealand IOC</u>
Sodium nitrite	7632-00-0	231-555-9	Present	Present	(1)-483	KE-31546	Present	HSR001286
Disodium tetraborate, anhydrous	1330-43-4	215-540-4	Present	Present	(1)-69	KE-12384	Present	HSR002799
Sodium nitrate	7631-99-4	231-554-3	Present	Present	(1)-484	KE-31545	Present	HSR001350
Sodium metasilicate	6834-92-0	229-912-9	Present	Present	(1)-508	KE-12354	Present	HSR003511
Sodium 2-mercaptobenzothiazole	2492-26-4	219-660-8	Present	Present	(5)-243	KE-02725	Present	HSR004677
Sodium tolytriazole	64665-57-2	265-004-9	Present	Present	(5)-3601	KE-23499	Present	May be used as a single component chemical under an appropriate group standard

## 16. Other information, including date of preparation or last revision

### NFPA Rating

0 - Minimal      1 - Slight      2 - Moderate      3 - Serious  
: *Health:* 2      *Flammability:* 0      *Instability:* 1      *Special Hazards:* None.

### HMIS Rating

: \* - Chronic hazard      0 - Minimal      1 - Slight      2 - Moderate      3 - Serious  
*Health:* \*3      *Flammability:* 0      *Reactivity:* 1

### Issue date

06/01/2015

### Version #

1

### Legend

ACGIH: American Conference of Governmental Industrial Hygienists  
AICS: Australian Inventory of Chemical Substances  
CAS: Chemical Abstract Services  
CSA: Canadian Standards Association  
EC50: Effective Concentration 50%.  
EINECS: European Inventory of Existing Commercial chemical Substances  
ENCS: Existing and New Chemical Substances  
HSDB: Hazardous Substances Data Bank  
IARC: International Agency for Research on Cancer  
IBC: Intermediate Bulk Container  
IECSC: Inventory of Existing Chemical Substances

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IMDG: International Maritime Dangerous Goods  
IOC: Inventory of Chemicals  
KECI: Korean Existing Chemicals Inventory  
KECL: Korean Existing Chemicals List  
LC: Lethal Concentration  
LD: Lethal Dose  
N/Ap: Not Applicable  
N/Av: Not Available  
NIOSH: National Institute of Occupational Safety and Health  
NOEC: No observable effect concentration  
NTP: National Toxicology Program  
OECD: Organisation for Economic Co-operation and Development  
OSHA: Occupational Safety and Health Administration  
PEL: Permissible exposure limit  
PICCS: Philippine Inventory of Chemicals and Chemical Substances  
RTECS: Registry of Toxic Effects of Chemical Substances  
SDS: Safety Data Sheet  
STEL: Short Term Exposure Limit  
TDG: Canadian Transportation of Dangerous Goods Act & Regulations  
TLV: Threshold Limit Values  
TSCA: Toxic Substance Control Act  
TWA: Time Weighted Average  
WHMIS: Workplace Hazardous Materials Identification System

### Bibliography

1. ACGIH, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices for 2015.
2. International Agency for Research on Cancer Monographs, searched 2015.
3. Canadian Centre for Occupational Health and Safety, CCIInfoWeb databases, 2015 (Chempendium, HSDB and RTECs).
4. Material Safety Data Sheets from manufacturer.
5. OECD - The Global Portal to Information on Chemical Substances - eChemPortal, 2015.

### Disclaimer

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