

SAFETY DATA SHEET**NOROX® AZOX**

Material no.		Version	2.0 / US
Specification	185444	Revision date	04/14/2015
Order Number		Print Date	04/14/2015
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1. Identification**1.1. Product identifier**

Trade name NOROX® AZOX

1.2. Recommended use of the chemical and restrictions on use

Relevant applications identified polymerization initiator

1.3. Details of the supplier of the safety data sheet

Company United Initiators, Inc.
334 Phillips 311 Rd.
Helena, AR 72342-9033
USA

Telephone 870-572-2935

Telefax 870-572-1416

Email address Cs-initiators.nafta@united-in.com

1.4. 24 HOUR EMERGENCY TELEPHONE NUMBERS:**CHEMTREC - US & CANADA:** 800-424-9300**CHEMTREC INTERNATIONAL:** +1 703-527-3887 (collect calls accepted)

Product Regulatory Services : 800-231-2702

2. Hazards identification**2.1. Classification of the substance or mixture**

Classification according to Regulation 29CFR 1910.1200

Flammable liquids	Category 4	H227
Oxidizing liquids	Category 1	H271
Organic peroxides	Type D	H242
Acute toxicity (Inhalation)	Category 3	H331
Skin corrosion	Category 1A	H314
Serious eye damage	Category 1	H318
Skin Sensitisation	Category 1	H317
Reproductive toxicity	Category 2	H361
Specific target organ toxicity - single exposure (Respiratory system)	Category 3	H335

2.2. Label elementsStatutory basis
Symbol(s)

Classification according to Regulation 29CFR 1910.1200



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Signal word **Danger**

Hazard statement H227 - Combustible liquid.
H242 - Heating may cause a fire.
H271 - May cause fire or explosion; strong oxidiser.
H314 - Causes severe skin burns and eye damage.
H317 - May cause an allergic skin reaction.
H318 - Causes serious eye damage.
H331 - Toxic if inhaled.
H335 - May cause respiratory irritation.
H361 - Suspected of damaging fertility or the unborn child.

Precautionary statement: P201 - Obtain special instructions before use.
Prevention P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P220 - Keep/Store away from clothing/ combustible materials.
P221 - Take any precaution to avoid mixing with combustibles.
P234 - Keep only in original container.
P261 - Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 - Wash skin thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P272 - Contaminated work clothing should not be allowed out of the workplace.
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection.
P283 - Wear fire/ flame resistant/ retardant clothing.

Precautionary statement: P301 + P330 + P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
Reaction P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated
clothing. Rinse skin with water/shower.
P304 + P340 + P310 - IF INHALED: Remove person to fresh air and keep
comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 + P310 - IF IN EYES: Rinse cautiously with water for several
minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or doctor/ physician.
P306 + P360 - IF ON CLOTHING: rinse immediately contaminated clothing and skin
with plenty of water before removing clothes.
P308 + P313 - IF exposed or concerned: Get medical advice/ attention.
P333 + P313 - If skin irritation or rash occurs: Get medical advice/ attention.
P363 - Wash contaminated clothing before reuse.
P370 + P378 - In case of fire: Use water spray, alcohol-resistant foam, dry chemical
or carbon dioxide to extinguish.
P371 + P380 + P375 - In case of major fire and large quantities: Evacuate area. Fight
fire remotely due to the risk of explosion.

Precautionary statement: P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.
Storage P405 - Store locked up.
P410 - Protect from sunlight.
P411 - Store at temperatures not exceeding 38°C (100°F).
P235 - Keep cool.
P420 - Store away from other materials.

Precautionary statement: P501 - Dispose of contents/ container to an approved waste disposal plant.
Disposal

2.3. Other hazards
None known.**3. Composition/information on ingredients**

• 2,4-Pentanedione, peroxide	28% - 30%
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CAS-No. 37187-22-7

Organic peroxides	Type D
Eye irritation	Category 2A
Skin Sensitisation	Category 1

• Phlegmatizers 52% - 62%

CAS-No. Proprietary

Flammable liquids	Category 4
Acute toxicity (Inhalation)	Category 3
Skin irritation	Category 2
Eye irritation	Category 2A
Specific target organ toxicity - single exposure (Respiratory system)	Category 3
Reproductive toxicity	Category 2

• Hydrogen peroxide 17% - 18%

CAS-No. 7722-84-1

Oxidizing liquids	Category 1
Acute toxicity (Oral)	Category 4
Skin corrosion	Category 1A
Serious eye damage	Category 1
Specific target organ toxicity - single exposure (Respiratory system)	Category 3
Chronic aquatic toxicity	Category 3

• 2,4-Pentanedione 1% - 5%

CAS-No. 123-54-6

Flammable liquids	Category 3
Acute toxicity (Oral)	Category 4
Acute toxicity (Inhalation)	Category 3
Acute toxicity (Dermal)	Category 3

Other information

This material is classified as hazardous under OSHA regulations.

4. First aid measures**4.1. Description of first aid measures****Inhalation**

If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If unconscious, evaluate the need for artificial respiration. Get immediate medical attention.

Skin contact

Immediately wash skin with soap and plenty of water. Remove contaminated clothing. Obtain medical attention immediately if symptoms occur. Wash clothing before reuse.

Eye contact

In case of contact, immediately flush eyes with plenty of water. Obtain medical attention if irritation develops.

Ingestion

If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

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

None known

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

None known.

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5. Fire-fighting measures**5.1. Extinguishing media**

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide., Dry Chemical combined with peroxide may reignite fire., Light water additives may be particularly effective at extinguishing peroxide fires.

Unsuitable extinguishing media: High volume water jet.

5.2. Special hazards arising from the substance or mixture

The heat of decomposition of the peroxides adds to the heat of the fire. Dry chemical fire extinguishing agent may catalyze the decomposition.

5.3. Advice for firefighters

If dry chemical is used to extinguish a peroxide fire, the extinguished area must be thoroughly wetted down with water to prevent reignition.

As in any fire, wear self-contained positive-pressure breathing apparatus and full protective gear.

Containers near the source of fire should be cooled with a water spray to prevent contents from reaching decomposition temperature.

6. Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**

Evacuate personnel to safe areas. Wear a self-contained breathing apparatus and appropriate personal protective equipment. (See Section 8 - Exposure Controls/Personal Protection.) Remove all sources of ignition. Ventilate the area.

6.2. Environmental precautions

Obey relevant local, state, provincial and federal laws and regulations. Do not contaminate any lakes, streams, ponds, groundwater or soil.

6.3. Methods and material for containment and cleaning up

Dike spill to prevent runoff from entering drains, sewers, streams, etc. Wet spilled material with water and absorb with an inert absorbent material such as perlite, vermiculite, or sand. Sweep up using non-sparking tools and place in a clean polyethylene drum or a polyethylene pail. DO NOT place into a steel container, lined or unlined, as decomposition may occur. Treat any contaminated cardboard packaging as hazardous waste. Wet container with additional water prior to sealing. Use absorbent/absorbent material to solidify liquids. Clean up promptly by sweeping or vacuum. Wear protective equipment, including eye protection, to avoid exposure (see Section 8 for specific handling precautions).

7. Handling and storage**7.1. Precautions for safe handling**

Rotate stock using the oldest material first. Avoid contact with skin, eyes and clothing. Use PPE as specified in section 8. Keep containers closed to prevent contamination. Keep away from sources of heat, sparks, or flame. Do not add to hot solvents or monomers as a violent decomposition and/or reaction may result. When using spray equipment, never spray raw peroxide onto curing or into raw resin or flues. Keep peroxide in its original container. DO NOT USE NEAR FOOD OR DRINK. Wash thoroughly after handling. Protect from contamination. Keep tightly sealed in original packing. Risk of decomposition. Wash thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

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Storage

The stability of peroxide formulations is directly related to the shipping and storage temperature history. Cool storage at 80° F (27°C) or below is recommended for longer shelf life and stability. Prolonged storage at elevated temperatures of 100° F (38°C) and higher will cause product degradation, gassing and potential container rupture which can result in a fire and/or explosion. Store out of direct sunlight in a well ventilated area away from combustible and incompatible material. **DO NOT STORE WITH FOOD OR DRINK.**

Refer to NFPA 400 Hazardous Materials Code from the National Fire Protection Association for additional storage information.

Further information

Store apart from other dangerous and incompatible substances.

STORE BELOW 38 °C (100 °F).

Keep away from direct sunlight.

Keep containers tightly closed in a cool, well-ventilated place.

8. Exposure controls/personal protection**8.1. Control parameters**

• 2,4-Pentanedione (US-GHS Haz)		
CAS-No.	123-54-6	
Control parameters	25 ppm	Time Weighted Average (TWA):(ACGIH)
Control parameters		Skin designation:(ACGIH)
	Can be absorbed through the skin.	
• Phlegmatizer		
CAS-No.		
Control parameters	10 ppm 40 mg/m3	Time Weighted Average (TWA):(WEEL)
Control parameters		Skin designation:(WEEL)
	Can be absorbed through the skin.	
• Hydrogen peroxide (US-GHS Haz)		
CAS-No.	7722-84-1	
Control parameters	1 ppm	Time Weighted Average (TWA):(ACGIH)
Control parameters	1 ppm 1.4 mg/m3	Permissible exposure limit:(OSHA Z1)
Control parameters	1 ppm 1.4 mg/m3	Time Weighted Average (TWA) Permissible Exposure Limit (PEL):(US CA OEL)

8.2. Exposure controls**Engineering measures**

Local exhaust and mechanical ventilation recommended.

8.3. Personal protective equipment**Respiratory protection**

A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 or applicable federal/provincial requirements must be followed whenever workplace conditions warrant respirator use. NIOSH's "Respirator Decision Logic" may be useful in determining the suitability of various types of respirators.

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Hand protection

Wear protective gloves made of the following materials:

Solvent-resistant gloves (butyl-rubber)

Nitrile rubber

Neoprene gloves

Skin should be washed after contact.

Eye protection

Use chemical splash goggles or face shield.

Skin and body protection

A safety shower and eye wash fountain should be readily available.

To identify additional Personal Protective Equipment (PPE) requirements, it is recommended that a hazard assessment in accordance with the OSHA PPE Standard (29CFR1910.132) be conducted before using this product.

Hygiene measures

Do not eat, drink or smoke during use.

Wash hands before breaks and immediately after handling the product.

Protective measures

Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing

9. Physical and chemical properties**9.1. Information on basic physical and chemical properties**

physical state	liquid
Colour	Water-white., to, light brown
Form	liquid
Odour	moderate
Odour Threshold	No data available
pH	not applicable
Melting point/range	no data available
Boiling point/range	not determined
Flash point	> 65 °C (Seta closed cup)
Evaporation rate	not determined
Flammability (solid, gas)	not applicable
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	no data available
Relative vapour density	> 1
Relative density	1.1
Water solubility	soluble

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Solubility/qualitative no data available

Partition coefficient: n-octanol/water no data available

Autoignition temperature no data available

Thermal decomposition > 60 °C
Method: SADT (UN test H.4)
Rapid, exothermic reaction may occur above the Self Accelerated Decomposition Temperature (SADT).
SADT-Self Accelerating Decomposition Temperature. Lowest temperature at which the tested package size will undergo a self-accelerating decomposition reaction. This reaction will generate flammable vapors which may autoignite.

Viscosity, dynamic no data available

Viscosity, kinematic not determined

9.2. Other information

peroxides The substance or mixture is an organic peroxide classified as type D.

10. Stability and reactivity**10.1. Reactivity**

Stable under recommended storage conditions.

10.2. Chemical stability

Contact with incompatible substances can cause disintegration at or below SADT.

10.3. Possibility of hazardous reactions

Stability Stable under recommended storage conditions.

Possibility of hazardous reactions Vapors may form explosive mixtures with air.

10.4. Conditions to avoid

Keep away from heat and sources of ignition.

Exposure to sunlight.

Prolonged storage above 100°F (38°). Storage above SADT. Storage near flammable or combustible material.

10.5. Incompatible materials

Keep away from strong acids, bases, heavy metals, salts, reducing agents and accelerators.

Contaminants (e.g. rust, dust, ash). Combustible materials., Risk of decomposition.

Dimethylaniline, cobalt naphthenate and other promoters, accelerators, reducing agents, or any hot material.

10.6. Hazardous decomposition products

Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke)., Irritant, caustic, flammable, noxious/toxic gases and vapors can develop in the case of fire and decomposition., Acrid smoke and irritating fumes.

11. Toxicological information

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11.1. Information on toxicological effects*No toxicological studies are available on the mixture.*

carcinogenicity assessment

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

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

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Toxicological information on components**2,4-Pentanedione, peroxide**

Acute oral toxicity	LD50 Oral Rat(male and female): > 2000 mg/kg
Acute inhalation toxicity	Rat(male): 13.1 mg/l / 1 h
Acute dermal toxicity	LD50 Dermal Rat(male and female): >= 2000 mg/kg
Eye irritation	/ Causes serious eye irritation. irritating Irritating to eyes.
Sensitization	Sensitising May cause sensitisation by skin contact.
Repeated dose toxicity	Rat(male and female) NOEL: 100 mg/kg NOAEL: 300 mg/kg

Phlegmatizer

Acute oral toxicity	LD50 Rat: 3914 mg/kg RTECS
Acute inhalation toxicity	LC50 Rat: > 5.1 mg/l / 4 h
Acute dermal toxicity	LD50 Rabbit: 8000 mg/kg RTECS
Skin irritation	irritating
Eye irritation	Irritation to eyes, reversing after 7 to 21 days.
Repeated dose toxicity	Rat(male and female) / 90-day NOAEL: 3000 ppm
Assessment of STOT single exposure	Routes of exposure: inhalation (vapour) Target Organs: Nose Assessment: May cause respiratory irritation. May cause respiratory irritation.
Toxicity to reproduction	Two-generation study Rat(male/female) NOAEL (No Observed Adverse Effect Level) of parents: 350 mg/kg

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NOAEL F1: 150 mg/kg
 May damage fertility or the unborn child.

reproduction toxicity assessment
 Teratogenicity May damage fertility or the unborn child.

Rat
 NOAEL (No Observed Adverse Effect Level)
 1000 mg/kg
 teratogenesis:
 NOAEL maternal (No Observed Adverse Effect Level):
 1000 mg/kg

CMR assessment
 Toxicity to reproduction May damage fertility or the unborn child.

2,4-Pentanedione
 Acute oral toxicity LD50 Oral Rat(male): 760 mg/kg
 LD50 Oral Rat(female): 570 mg/kg
 Acute inhalation toxicity LC50 Rat: 5.1 mg/l / 4 h
 Acute dermal toxicity LD50 Dermal Rat(female): 790 mg/kg
 LD50 Dermal Rat(male): 1370 mg/kg
 Skin irritation slight irritation
 Eye irritation slight irritation
 Repeated dose toxicity Dermal Rat(male and female)
 NOAEL: 244 mg/kg
 LOAEL: 975 mg/kg

12. Ecological information**12.1. Toxicity**

Toxicity to fish There is no data available for this product.
 Toxicity in aquatic invertebrates No data is available on the product itself.
 Toxicity to algae No data is available on the product itself.

12.2. Persistence and degradability

Biodegradability no data available

12.3. Bioaccumulative potential

Bioaccumulation no data available

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12.4. Mobility in soil

Mobility No data available

12.5. Other adverse effects

Further Information Avoid release to the environment.

13. Disposal considerations**13.1. Waste treatment methods****Product**

Waste must be disposed of in accordance with federal, state and local regulations. Incineration is the preferred method of disposal. Contact United Initiators for additional information. Empty containers must be handled with care due to product residue. **DO NOT HEAT OR CUT THE EMPTY CONTAINER WITH ELECTRIC OR GAS TORCH.**

Uncleaned packaging

Packaging material should be recycled or disposed of in accordance with federal, state and local regulations.

14. Transport information**D.O.T. Road/Rail**

14.1. UN number:	UN 3105
14.2. UN proper shipping name:	Organic peroxide type D, liquid(Acetyl Acetone Peroxide, <=42%)
14.3. Transport hazard class(es):	5.2
14.4. Packing group:	II
14.5. Environmental hazards (Marine pollutant):	--
14.6. Special precautions for user:	No

Air transport ICAO-TI/IATA-DGR

14.1. UN number:	UN 3105
14.2. UN proper shipping name:	Organic peroxide type D, liquid(Acetyl Acetone Peroxide, <=42%)
14.3. Transport hazard class(es):	5.2
14.4. Packing group:	--
14.5. Environmental hazards:	--
14.6. Special precautions for user:	Yes

IATA-C: ERG-Code 5L
Must be protected from direct sunlight and stored away from all sources of heat in a well-ventilated area.

IATA-P: ERG-Code 5L
Must be protected from direct sunlight and stored away from all sources of heat in a well-ventilated area.

Sea transport IMDG-Code/GGVSee (Germany)

14.1. UN number:	UN 3105
14.2. UN proper shipping name:	ORGANIC PEROXIDE TYPE D, LIQUID(Acetyl Acetone Peroxide, <=42%)

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- 14.3. Transport hazard class(es): 5.2
14.4. Packing group: --
14.5. Environmental hazards (Marine pollutant): --
14.6. Special precautions for user: Yes
EmS: F-J,S-R
"Separated from" acids and alkalis.
Protected from sources of heat.
- 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: for transport approval see regulatory information

15. Regulatory information**US Federal Regulations****OSHA**

If listed below, chemical specific standards apply to the product or components:

- None listed

Clean Air Act Section (112)

If listed below, components present at or above the de minimus level are hazardous air pollutants:

- None listed

CERCLA Reportable Quantities

If listed below, a reportable quantity (RQ) applies to the product based on the percent of the named component:

- None listed

SARA Title III Section 311/312 Hazard Categories

The product meets the criteria only for the listed hazard classes:

- Acute Health Hazard
- Chronic Health Hazard
- Fire Hazard

SARA Title III Section 313 Reportable Substances

If listed below, components are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

- Phlegmatizer

Toxic Substances Control Act (TSCA)

If listed below, non-proprietary substances are subject to export notification under Section 12 (b) of TSCA:

• 2,4-Pentanedione
CAS-No. 123-54-6

One-Time Export Notification only.

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State Regulations**California Proposition 65**

A warning under the California Drinking Water Act is required only if listed below:

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

- Phlegmatizer

International Chemical Inventory Status

Unless otherwise noted, this product is in compliance with the inventory listing of the countries shown below. For information on listing for countries not shown, contact the Product Regulatory Services Department.

Europe (EINECS/ELINCS)	listed/registered
USA (TSCA)	listed/registered
Canada (DSL)	listed/registered
Australia (AICS)	listed/registered
Japan (MITI)	listed/registered
Philippines (PICCS)	listed/registered
China	listed/registered
Korea	listed/registered
New Zealand	not listed/registered

An employer using HMIS/NFPA labeling must through training ensure that its employees are fully aware of the hazards of the chemicals used.

HMIS Ratings

Health :	2*
Flammability :	1
Physical Hazard :	1

NFPA Ratings

Health :	2
Flammability :	1
Reactivity :	1

16. Other information**Further information**

Revision date 04/14/2015

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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The information provided in this 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.

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Legend

ACC	American Chemistry Council
ACGIH	American Conference of Governmental Industrial Hygienists
ACS	Advisory Committee on Sustainability
ADI	Acceptable Daily Intake
ASTM	American Society for Testing and Materials
ATP	Adaptation to Technical Progress
BCF	Bioconcentration factor
BOD	Biochemical oxygen demand
c.c.	closed cup
CAO	Cargo Aircraft Only
Carc	Carcinogen
CAS	Chemical Abstract Services
CDN	Canada
CEPA	Canadian Environmental Protection Act
CERCLA	Comprehensive Environmental Response – Compensation and Liability Act
CFR	Code of Federal Regulations
CMR	carcinogenic-mutagenic-toxic for reproduction
COD	Chemical oxygen demand
DIN	German Institute for Standardization
DMEL	Derived minimum effect level
DNEL	Derived no effect level
DOT	Department of Transportation
EC50	half maximal effective concentration
EPA	Environmental Protection Agency
ErC50	Reduction of Growth Rate
ERG	Emergency Response Guide Book
FDA	Food and Drug Administration
GHS	Globally Harmonized System of Classification and Labelling of Chemicals (GHS)
GLP	Good Laboratory Practice
GMO	Genetic Modified Organism
HCS	Hazard Communication Standard
HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IBC	Intermediate Bulk Container
ICAO-TI	International Civil Aviation Organization- Technical Instructions
ICCA	International Council of Chemical Association
ID	Identification number
IMDG	International Maritime Dangerous Goods
IUPAC	International Union of Pure and Applied Chemistry
ISO	International Organization For Standardization
LC50	50 % Lethal Concentration
LD50	50 % Lethal Dose
L(E)C50	LC50 or EC50
LOAEL	Lowest observed adverse effect level
LOEL	Lowest observed effect level
MARPOL	International Convention for the Prevention of Pollution from Ships
NFPA	National Fire Protection Association
NOAEL	No observed adverse effect level
NOEC	no observed effect concentration
NOEL	no observed effect level
o. c.	open cup
OECD	Organisation for Economic Cooperation and Development
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
PBT	Persistent, bioaccumulative, toxic
PEC	Predicted effect concentration
PNEC	Predicted no effect concentration
RQ	Reportable Quantity
SDS	Safety Data Sheet
STOT	Specific Target Organ Toxicity
UN	United Nations
vPvB	very persistent, very bioaccumulative
voc	volatile organic compounds

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WHMIS
WHOWorkplace Hazardous Materials Information System
World Health Organization