

**SAFETY DATA SHEET****NOROX® TBPB**

Material no.		Version	<b>1.0 / US</b>
Specification	<b>150762</b>	Revision date	<b>01/12/2015</b>
Order Number		Print Date	<b>04/13/2015</b>
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**1. Identification****1.1. Product identifier**

Trade name NOROX® TBPB

**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

Organic peroxides	Type C	H242
Acute toxicity (Inhalation)	Category 4	H332
Skin irritation	Category 2	H315
Skin Sensitisation	Category 1	H317
Acute aquatic toxicity	Category 1	H400
Chronic aquatic toxicity	Category 3	H412

**2.2. Label elements**Statutory basis  
Symbol(s)

Classification according to Regulation 29CFR 1910.1200



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Signal word	Danger
Hazard statement	H242 - Heating may cause a fire. H315 - Causes skin irritation. H317 - May cause an allergic skin reaction. H332 - Harmful if inhaled. H400 - Very toxic to aquatic life.
Precautionary statement: Prevention	P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking. P220 - Keep/Store away from clothing/ strong acids, bases, heavy metal salts and other reducing substances /combustible materials. 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. P273 - Avoid release to the environment. P280 - Wear protective gloves/ eye protection/ face protection.
Precautionary statement: Reaction	P302 + P352 - IF ON SKIN: Wash with plenty of water/ soap. P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P312 - Call a POISON CENTER or doctor/ physician if you feel unwell. P321 - Specific treatment (see supplemental first aid instructions on this label). P333 + P313 - If skin irritation or rash occurs: Get medical advice/ attention. P362 - Take off contaminated clothing and wash before reuse. P363 - Wash contaminated clothing before reuse. P391 - Collect spillage.
Precautionary statement: Storage	P410 - Protect from sunlight. P411 - Store at temperatures not exceeding 27°C (80°F). P235 - Keep cool. P420 - Store away from other materials.
Precautionary statement: Disposal	P501 - Dispose of contents/ container to an approved waste disposal plant.

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

<b>• tert-Butyl perbenzoate</b>	97% - 100%
CAS-No.	614-45-9
Organic peroxides	Type C
Acute toxicity (Inhalation)	Category 4
Skin irritation	Category 2
Skin Sensitisation	Category 1
Acute aquatic toxicity	Category 2
Chronic aquatic toxicity	Category 3

**Other information**

This material is classified as hazardous under OSHA regulations.

**4. First aid measures**

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**4.1. Description of first aid measures****General advice**

Take off contaminated clothing immediately.  
Never give anything by mouth to an unconscious person.  
Remove from exposure, lie down.  
If feeling unwell seek medical advice.

**Inhalation**

If inhaled remove to fresh air. If cough or other symptoms develops or persists get medical attention.

**Skin contact**

Wash off with soap and water.  
Consult a physician in case of eye irritation.

**Eye contact**

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**Ingestion**

If large quantities of this material are swallowed, call a physician immediately.  
DO NOT induce vomiting unless directed to do so by a physician or poison control center.  
Never give anything by mouth to an unconscious person.  
Should vomiting occur, be sure to keep victim's head below hips to avoid aspiration of vomitus into the lungs.

**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.

Unsuitable extinguishing media: High volume water jet.

**5.2. Special hazards arising from the substance or mixture**

Contact with incompatible materials or exposure to temperatures exceeding the SADT may result in a self acceleration decomposition reaction with release of flammable vapors which may autoignite.  
Cool closed containers exposed to fire with water spray.  
Containers exposed to temperatures exceeding the SADT (see section 10) may explode.  
Vapors can travel to a source of ignition and flash back.  
Do not allow run-off from fire fighting to enter drains or water courses.

**5.3. Advice for firefighters**

Evacuate area and fight fire from a safe distance.  
Containers near the source of fire should be cooled with a water spray to prevent contents from reaching decomposition temperature.  
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.  
As in any fire, wear self-contained positive-pressure breathing apparatus, (MSHA/NIOSH approved or equivalent) and full protective gear.

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

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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, rivers, groundwater or soil.

**6.3. Methods and material for containment and cleaning up**

Organic Peroxide spills should be attended to immediately. Contain spill and absorb with an inert absorbent material and then wet down the mixture with water. Sweep up mixture of spilled organic peroxide and inert absorbent material using non-sparking tools and place in polyethylene bags for disposal. The sweepings in the polyethylene bag should be further wetted with water and disposed of immediately by an approved disposal company. If stored for any period of time, store out of direct sunlight in a cool, well-ventilated place. After all the material has been picked up, wash down the spill area with surfactant and water to remove any traces of organic peroxide. Allow for sufficient ventilation to aid in the removal of fumes that may be present.

**Additional advice**

Never return spills in original containers for re-use.

Dispose of contaminated material as waste in accordance with section 13.

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

Keep away from heat. Keep away from sparks, flames and other sources of ignition. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use with adequate ventilation. The need for grounding and bonding of containers in accordance with OSHA 29 CFR 1910.106 and NFPA 77 should be assessed for all product transfers. Follow all MSDS/label precautions even after the container is emptied because it may retain product residues. Wash thoroughly after handling. Do not swallow product. Use personal protective equipment. Protect from contamination. Dispense and transfer in an area separate from storage area. Never return unused material to storage receptacle. Wash contact areas after handling. Remove contaminated clothing and wash before reuse. The addition of accelerators may result in vigorous decomposition.

**7.2. Conditions for safe storage, including any incompatibilities****Advice on protection against fire and explosion**

Containers exposed to temperatures exceeding the SADT (see section 10) may decompose violently. Consult with specialists to ensure design protects against these hazards.

Avoid contact with copper containing metals/alloys due to the risk of accelerated decomposition reaction which can be violent.

**Storage**

Heat or contamination may cause hazardous decomposition.

Keep containers dry and tightly closed to avoid moisture absorption and contamination.

Keep container away from flammable and explosive substances.

Protect from heat and exposure to direct sunlight

Store in original container.

Transport and store container in upright position only.

Residual vapors might explode on ignition; do not apply heat, cut, drill, grind or weld on or near this container.

Consult NFPA 400 for storage area guidance. Storage and handling designs should be arranged in consultation with a person experienced in these types of assessments.

**Further information**

Store at or below 27°C (80°F).

Peroxide residues must not be returned into the original container, danger of decomposition!

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**Advice on common storage**

Do not store together with:  
acids, alkalis, reducing agents, metallic salts.

**Storage stability**

10 - 30 °C

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

Contains no substances with occupational exposure limit values.

**8.2. Exposure controls****Engineering measures**

Use process enclosures, local exhaust ventilation or other engineering controls to control airborne exposure.

**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.

**Hand protection**

Use impermeable gloves.

Personal protective equipment that provides a barrier to prevent dermal exposure to this substance is required.

Gloves must be inspected prior to use.

The above mentioned hand protection is based on knowledge of the chemistry and anticipated uses of this product but it may not be appropriate for all workplaces. A hazard assessment should be conducted prior to use to ensure suitability of gloves for specific work environments and processes prior to use.

Suitability for specific workplaces should be clarified with protective glove manufacturers.

Glove material butyl rubber

Material thickness 0.5 mm

Break through time > 8 hrs

**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**

Remove and wash contaminated clothing before re-use.

Wash contact areas after handling.

Keep away from food, drink and animal feedingstuffs.

All protective equipment that has been contaminated should be cleaned before reuse.

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

physical state liquid  
Colour slightly yellow

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Form	liquid
Odour	very faint, ester-like
Odour Threshold	not applicable
pH	No data available
Melting point/range	9 - 11 °C
Boiling point/range	Not applicable. decomposition
Flash point	100 °C Method: Setaflash Closed Cup
Evaporation rate	not applicable
Flammability (solid, gas)	Not applicable.
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	0.003 hPa (20 °C)
Relative vapour density	no data available
Relative density	no data available
Density	1.04 g/cm <sup>3</sup> (20 °C)
Water solubility	1.140 - 1.220 g/l
Solubility in other solvents	Medium: Alcohol miscible
Partition coefficient: n-octanol/water	log Pow: 3.0 (25 °C)
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	8 mPa.s (20 °C)
Viscosity, kinematic	no data available

**9.2. Other information**

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

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**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	Product will not undergo hazardous polymerization.
Possibility of hazardous reactions	When coming in contact with the product, impurities, decomposition catalysts, metallic salts, alkalis, reducing agents may lead to self-accelerated, exothermic decomposition and the formation of oxygen compounds. Risk of decomposition when exposed to heat.

**10.4. Conditions to avoid**

Keep away from heat and sources of ignition.

**10.5. Incompatible materials**

Heavy metal compounds, reducing agents, Combustible material, Strong acids and strong bases, Oxidizing agents, impurities, metal ions, metallic salts, metals.

**10.6. Hazardous decomposition products**

Temperatures at or above the SADT can result in the release of hazardous decomposition products which are flammable and can autoignite., In case of fire and decomposition formation of inflammable and explosive, irritant, corrosive, harmful and toxic gases and vapors possible.

Contact with incompatible materials or exposure to temperatures exceeding the SADT may result in a self acceleration decomposition reaction with release of flammable vapors which may autoignite.

**11. Toxicological information****11.1. Information on toxicological effects**

carcinogenicity assessment	Contains no carcinogenic substances as defined by NTP, IARC and/or OSHA.
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**Toxicological information on components****tert-Butyl perbenzoate**

Acute oral toxicity	LD50 rat: > 2000 mg/kg Test substance: pure substance
Acute inhalation toxicity	LC50 Rat: 4.9 mg/l / 4 h / dust/mist Assessment: Harmful if inhaled.
Acute dermal toxicity	LD50 Rat: > 2000 mg/kg
Skin irritation	/ Causes skin irritation. Skin irritation
Eye irritation	/ No eye irritation No eye irritation

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Sensitization	Maximisation Test (GPMT) : May cause sensitisation by skin contact. Test substance: pure substance Causes sensitisation.
Mutagenicity assessment	When tested in the Ames Mutation test, tert-Butyl peroxybenzoate has shown both weakly positive and negative results. In the Mouse Lymphoma and Sister Chromatid Exchange Assays, tert-Butyl peroxybenzoate produced positive results.
Toxicity to reproduction	no data available
Further information	When administered in drinking water, at various concentrations, up to 500 mg/Kg, tert-Butyl peroxybenzoate caused forestomach lesions in rats and mice in a dose-dependent fashion. Overexposure to the aromatic diluent in animals has been shown to lower the activity of certain immune system cells and has been suggested as a cause of blood abnormalities, cardiac sensitization, liver abnormalities and kidney damage. In humans it has also been suggested as a cause for liver damage.

**12. Ecological information****12.1. Toxicity**

Toxicity to fish	LC50 Danio rerio (zebra fish): 1.6 mg/l / 96 h Test substance: pure substance
Toxicity in aquatic invertebrates	EC50 Daphnia (water flea): 11 mg/l / 24 h
Toxicity to algae	EC50 Pseudokirchneriella subcapitata: 0.8 mg/l / 72 h
Toxicity to bacteria	EC50 Bacteria: 43 mg/l / 0.30 h

**12.2. Persistence and degradability**

Biodegradability	Concentration: 1 mg/l Exposure time: 28 d Result: rapidly biodegradable Method: OECD 301 D
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**12.3. Bioaccumulative potential**

Bioaccumulation	no data available
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**12.4. Mobility in soil**

Mobility	no data available.
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**12.5. Other adverse effects**

Further Information	No data available
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**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.**

**Product**

RCRA Classification Ignitable D001.

RCRA Classification Reactive D003.

**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 3103   |
| 14.2. UN proper shipping name:                  | Organic peroxide type C, liquid(tert-Butyl peroxybenzoate, 98%) |
| 14.3. Transport hazard class(es):               | 5.2   |
| 14.4. Packing group:                            | II  |
| 14.5. Environmental hazards (Marine pollutant): | Yes   |
| 14.6. Special precautions for user:             | No  |

**Air transport ICAO-TI/IATA-DGR**

- |                                     |   |
|-------------------------------------|---|
| 14.1. UN number:                    | UN 3103   |
| 14.2. UN proper shipping name:      | Organic peroxide type C, liquid(tert-Butyl peroxybenzoate, 98%) |
| 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 3103   |
| 14.2. UN proper shipping name:                  | ORGANIC PEROXIDE TYPE C, LIQUID(tert-Butyl peroxybenzoate, 98%) |
| 14.3. Transport hazard class(es):               | 5.2   |
| 14.4. Packing group:                            | --  |
| 14.5. Environmental hazards (Marine pollutant): | Yes   |

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- 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

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**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:

- Reactivity Hazard
- Acute Health 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:

- None listed

**Toxic Substances Control Act (TSCA)**

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

- None listed

**State Regulations****California Proposition 65**

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

- None listed

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**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	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 :	3

**NFPA Ratings**

Health :	2
Flammability :	1
Reactivity :	3

**16. Other information****Further information**

Revision date 01/12/2015

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

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**

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

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**WHMIS**  
**WHO**Workplace Hazardous Materials Information System  
World Health Organization