

**Safety Data Sheet**  
**Methyl Acetoacetate**

**SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION**

**1.1 Product identifier**

**Product name:** Methyl Acetoacetate

**Synonym(s):** Acetoacetic acid methyl ester; MMA; 3-Oxobutanoic acid methyl ester

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

**General use:** Industrial and laboratory applications

**Uses advised against:** None known

**1.3 Details of the supplier and of the safety data sheet**

**Manufacturer/Distributor**

Silver Fern Chemical, Inc.

2226 Queen Anne Avenue North, Suite C

Seattle, WA 98109 USA

1-866-282-3384

Website - www.silverfernchemical.com; email address - info@silverfernchemical.com

**1.4 Emergency telephone number**

+1-800-535-5053; Outside USA & Canada +1-352-323-3500

**SECTION 2 - HAZARDS IDENTIFICATION**

**2.1 Classification of substance or mixture**

**Product definition:** Substance

**Classification in accordance with 29 CFR 1910 (OSHA HCS) and Regulation EC No. 1272/2008**

Flammable Liquid - Category 4 [H227]

Eye Irritation - Category 2A [H319]

**2.2 Label elements**

**Hazard symbol(s):**



GHS07

**Signal word:** Warning

**Hazard statement(s):** H227 - Combustible liquid

H319 - Causes serious eye irritation

**Precautionary statements:**

**[Prevention]**

P210 - Keep away from heat, open flames and hot surface. No smoking.

P264 - Wash hands and other exposed skin areas thoroughly after handling.

P280 - Wear protective gloves, protective clothing and eye protection.

**[Response]**

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

P337 + P313 - If eye irritation persists: Get medical attention.

P370 + P378 - In case of fire: Use water fog, foam, dry chemical or carbon dioxide for extinction.

**[Storage]**

P403 + P235 - Store in a well-ventilated place. Keep cool.

**[Disposal]**

P501 - Dispose of contents and containers in accordance with national and local regulations.

**2.3 Hazards not otherwise classified (HNOC) or not covered by GHS**

None as defined under 29 CFR 1910.1200.

**SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS**

**3.1 Substances**

% by Weight	Ingredient	CAS Number	EC Number	Index Number	GHS Classification
≤ 100	Methyl Acetoacetate	105-45-3	203-299-8	607-137-00-0	H226, H319

There are no additional ingredients present in this product which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

**3.2 Mixtures**

Not applicable

## SECTION 4 – FIRST AID MEASURES

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### 4.1 Description of first aid measures

**Inhalation:** If product mist or vapor causes respiratory irritation or distress, move the exposed person to fresh air immediately. If breathing is difficult or irregular, administer oxygen; if respiratory arrest occurs, start artificial respiration by trained personnel. If unconscious, maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Seek immediate medical attention.

**Eyes:** Immediately flush eyes with large amounts of water or saline solution for at least 15 minutes, occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do after first 2 minutes and continue rinsing. Seek immediate medical attention, preferably from an ophthalmologist.

**Skin:** Rinse skin with water while removing contaminated clothing. Wash the affected area with soap and water followed by thorough rinsing. Wash contaminated clothing and shoes before reuse. If irritation persists, seek immediate medical attention.

**Ingestion:** Rinse mouth with water if the victim is conscious. Remove dentures if present. DO NOT induce vomiting unless directed to do so by medical personnel. Vomiting may occur spontaneously. To prevent aspiration of vomit into the lungs, lay the victim on one side with the head lower than the waist. Never give anything by mouth to an unconscious or convulsing person. Do not leave the victim unattended. Seek medical attention if the victim feels unwell or if a large quantity of material has been ingested.

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

#### Potential health symptoms and effects

**Eyes:** Causes serious eye irritation with redness, swelling, pain and tearing. Prolonged eye contact may cause eye damage. Mist or vapor can cause eye irritation.

**Skin:** May cause skin irritation with localized redness, itching and discomfort.

**Inhalation:** Inhalation of mist or vapor may cause irritation of the upper respiratory tract. Symptoms may include headache, sore throat, cough and difficulty breathing. Prolonged exposure may cause central nervous system depression characterized by dizziness and drowsiness.

**Ingestion:** May cause gastrointestinal irritation with nausea, vomiting, abdominal pain and diarrhea. May be harmful if swallowed.

**Chronic:** Individuals with pre-existing skin conditions and respiratory disorders may be more susceptible to the effects of this product. Prolonged or repeated skin contact may aggravate existing skin conditions.

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

#### Advice to doctor and hospital personnel

Treat symptomatically and supportively.

## SECTION 5 – FIRE FIGHTING MEASURES

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### 5.1 Extinguishing media

**Suitable methods of extinction:** Use extinguishing media such as dry chemical, carbon dioxide, alcohol-resistant foam, water spray or water fog.

**Unsuitable methods of extinction:** Water jets or streams can spread the fire.

### 5.2 Special hazards arising from the substance or mixture

Combustible liquid! Vapors are heavier than air and can travel along the ground to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. Closed containers may rupture due to the buildup of pressure when exposed to extreme heat. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent or may be delayed. Obtain medical attention.

**Explosion hazards:** Avoid high temperatures, hot surfaces and sources of ignition.

### 5.3 Advice to firefighters

Full protective equipment including self-contained breathing apparatus should be used. Water may be used to cool closed containers to prevent pressure buildup and possible autoignition or explosion when exposed to extreme heat. Water contaminated by this material must be contained from being discharged to any waterway, sewer or drain to prevent environmental contamination.

## SECTION 6 – ACCIDENTAL RELEASE MEASURES

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### 6.1 Personal precautions, protective equipment and emergency procedures

Evacuate non-essential personnel. Wear appropriate protective clothing and equipment designated in Section 8.2. Ventilate the area. Remove all sources of ignition. NO SMOKING. Clean up spills immediately. Spill creates a slip hazard.

### 6.2 Environmental precautions

Avoid dispersal of spilled material or runoff and prevent contact with soil and entry into drains, sewers or waterways.

### 6.3 Methods and materials for containment and cleaning up

Approach spill from upwind direction. Cover drains and contain spill. DO NOT flush spills down the drain. Cover spill with a large quantity of inert absorbent. Do not use combustible material such as sawdust. Collect material using non-sparking tools and place in an approved container for proper disposal. Observe possible material restrictions (Sections 7.2 and 10.5). Clean contaminated area with soap and water. Do not allow material or runoff from rinsing contaminated areas to enter floor drains or storm drains and ditches that lead to waterways. Dispose of material via a licensed waste disposal contractor.

## 6.4 Reference to other sections

For indications about waste treatment, see Section 13.

## SECTION 7 – STORAGE AND HANDLING

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### 7.1 Precautions for safe handling

Wear all appropriate personal protective equipment specified in Section 8.2. Do not get in eyes or on skin or clothing. NO SMOKING. Do not breathe vapor or mist. If normal use of material presents a respiratory hazard, use only adequate ventilation or wear an appropriate respirator. Wash contaminated clothing and shoes thoroughly after use.

#### Advice on protection against fire and explosion

Avoid exposure to high temperatures, sources of ignition and hot surfaces.

### 7.2 Conditions for safe storage, including any incompatibilities

Store in dry, cool, well-ventilated areas away from incompatible materials (see Section 10.5), food and drink. Keep away from heat and ignition sources. Transfer only to approved containers having correct labeling. Keep container tightly closed when not in use. Protect containers from physical damage. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Containers of this material are hazardous when empty as they contain product residues. Use appropriate containment to avoid environmental contamination. Ventilate closed areas. Keep out of reach of children.

### 7.3 Specific end uses

Apart from the uses mentioned in Section 1.2, no other specific uses are stipulated.

## SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

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### 8.1 Control parameters

Contains no substances with occupational exposure limit values.

### 8.2 Exposure controls

**Engineering measures:** Technical measures and appropriate working operations should be given priority over the use of personal protective equipment. Use adequate ventilation. Local exhaust is preferable. Refer to Section 7.1.

**Individual protection measures:** Wear protective clothing to prevent repeated or prolonged contact with product. Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the representative supplier.

**Hygiene measures:** Facilities storing or using this material should be equipped with an eyewash station and safety shower. Change contaminated clothing. Preventive skin protection is recommended. Wash hands thoroughly after use, before eating, drinking, smoking or using the lavatory.

**Eye/face protection:** Wear protective splash goggles or safety glasses with unperforated side shields during use. A face shield is recommended if splashing is anticipated during use.

**Hand protection:** Wear gloves made of butyl rubber or those recommended by glove supplier for protection against materials in Section 3. Gloves should be impermeable to chemicals and oil. Breakthrough time of selected gloves must be greater than the intended use period.

**Skin protection:** Wear protective clothing, if needed. Wear protective boots if the situation requires.

**Respiratory protection:** Always use an approved respirator when vapor/aerosols exceed permissible exposure limits. Where risk assessment shows air-purifying respirators are appropriate use a half-mask respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Follow OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149.

**Environmental exposure controls:** Do not empty into drains.

*PPE must not be considered a long-term solution to exposure control. PPE usage must be accompanied by employer programs to properly select, maintain, clean fit and use. Consult a competent industrial hygiene resource to determine hazard potential and/or the PPE manufacturers to ensure adequate protection*



## SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

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### 9.1 Information on basic physical and chemical properties

<b>Appearance</b>	Clear, colorless liquid
<b>Odor</b>	Characteristic
<b>Odor Threshold</b>	No data available
<b>Molecular Weight</b>	116.12 g/mol
<b>Chemical Formula</b>	C <sub>5</sub> H <sub>8</sub> O <sub>3</sub>
<b>pH</b>	4.1 @ 10 g/l

<b>Freezing/Melting Point</b>	- 30 °C (- 22 °F)
<b>Boiling Point</b>	164 °C (327.2 °F) @ 1,013 hPa
<b>Evaporation Rate</b>	0.12
<b>Flammability (solid, gas)</b>	Not applicable
<b>Flash Point</b>	63.5°C (146.3 °F), PMCC @ 1,013 hPa
<b>Autoignition Temperature</b>	No data available
<b>Decomposition Temperature</b>	No data available
<b>Lower Explosive Limit (LEL)</b>	No data available
<b>Upper Explosive Limit (UEL)</b>	No data available
<b>Vapor Pressure</b>	18.7 Pa @ 20 °C
<b>Vapor Density</b>	4.0 [Air =1]
<b>Specific Gravity</b>	1.08 @ 20 °C
<b>Viscosity, Dynamic</b>	1.74 mPa·s @ 20 °C
<b>Viscosity, Kinematic</b>	1.61 mm <sup>2</sup> /s @ 20 °C
<b>Solubility in Water</b>	Miscible (> 1,000 g/l @ 20 °C)
<b>Partition Coefficient (n-octanol/water)</b>	log P <sub>ow</sub> = - 0.4
<b>Oxidizing Properties</b>	Not applicable
<b>Explosive Properties</b>	Not applicable
<b>Volatiles by Weight @ 21 °C</b>	No data available

## 9.2 Other Data

No data available

## SECTION 10 – STABILITY AND REACTIVITY

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### 10.1 Reactivity

This material is stable under normal handling conditions and use.

### 10.2 Chemical Stability

This material is stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

Hazardous polymerization will not occur.

### 10.4 Conditions to avoid

Avoid temperature extremes, hot surfaces, contact with incompatible materials.

### 10.5 Incompatible materials

Strong oxidizing agents

### 10.6 Hazardous decomposition products

Thermal decomposition products include oxides of carbon.

## SECTION 11 – TOXICOLOGICAL INFORMATION

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### 11.1 Information on toxicological effects

#### Acute oral toxicity

LD<sub>50</sub>, rat: 2,580 mg/kg

#### Acute inhalation toxicity

LC<sub>50</sub>, rat: 49.2 mg/l - 4 h

#### Acute dermal toxicity

LD<sub>50</sub>, rat: > 2,000 mg/kg

#### Skin irritation

May cause skin irritation.

#### Eye irritation

Causes serious eye irritation.

#### Sensitization

No data available

#### Carcinogenicity

No data available

#### Germ cell mutagenicity

No data available

#### Reproductive toxicity

No data available

**Specific organ toxicity - single exposure**

No data available

**Specific organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**11.2 Further information**

This product contains no substances present at levels greater than or equal to the 0.1% threshold (de minimis) that are identified as a probable, possible, potential or confirmed carcinogens by ACGIH, IARC, NTP or OSHA. No data is available regarding the mutagenicity or teratogenicity of this product, nor is there any available data that indicates that it causes adverse developmental or fertility effects.

Handle in accordance with good industrial hygiene and safety practice.

**SECTION 12 - ECOLOGICAL INFORMATION****12.1 Toxicity**

This material is relatively non-toxic to aquatic organisms on an acute basis.

**Acute toxicity to fish:** LC<sub>50</sub> - Pimephales promelas (Fathead minnow), static test, 96 h: 111.4 mg/l

**Toxicity to aquatic invertebrates:** EC<sub>50</sub> - Daphnia magna (Water flea), 48 h: 100 mg/l, immobilization

**Toxicity to aquatic plants:** EC<sub>50</sub> - Chlorella pyrenoidosa (green algae), 72 h: 100 mg/l, growth inhibition

**12.2 Persistence and degradability**

This product is readily biodegradable.

**12.3 Bioaccumulation potential**

This bioaccumulation potential for this material is low.

**12.4 Mobility in soil**

No data available

**12.5 Results of PBT and vPvB assessment**

This material is not persistent, bioaccumulative and toxic (PBT) and not very persistent and very bioaccumulative (vPvB).

**12.6 Other effects****Additional ecological information**

Do not allow material to run into surface waters, wastewater or soil.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

**SECTION 13 – DISPOSAL CONSIDERATIONS****13.1 Waste treatment methods**

Methods of disposal: The generation of waste should be avoided or minimized whenever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

**RCRA F-Series:** No listings above the reportable threshold (de minimis)

**RCRA U-Series:** No listings above the reportable threshold (de minimis)

**SECTION 14 – TRANSPORTATION INFORMATION**

**Note:** Transportation information provided is for reference only. Customer is urged to consult 49 CFR 100 - 177, IMDG, IATA, EC, United Nations TDG and WHMIS (Canada) TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.

*A flammable liquid with a flash point at or above 38 °C (100 °F) that does not meet the definition of any other hazard class may be reclassified as a combustible liquid. This provision does not apply to transportation by vessel or aircraft, except where other means of transportation are impracticable.*

*May be reclassified as not regulated for transport in non-bulk packages having a maximum capacity less than or equal to 450 liters (119 gallons).*

**USA DOT (Ground Transportation) - Bulk**

<b>Proper Shipping Name</b>	Combustible liquid, n.o.s. (Methyl Acetoacetate)
<b>Hazard Class</b>	Comb liq
<b>NA</b>	NA1993
<b>Packing Group</b>	III
<b>NAREG</b>	Guide #128
<b>Packaging Authorization</b>	Non-Bulk: 49 CFR 173.203; Bulk: 173.241
<b>Packaging Exceptions</b>	49 CFR 173.150

**Drum Label(s)**

<b>IMO/IMDG (Water Transportation)</b>	Not regulated for transport (Consult IMO regulations before transporting ocean bulk.)
<b>ICAO/IATA (Air Transportation)</b>	Not regulated for transport
<b>RID/ADR (Rail Transportation)</b>	Not regulated for transport

## SECTION 15 - REGULATORY INFORMATION

### 15.1 Safety, health and environmental regulations/legislation specific for substance or mixture

#### U. S. Federal Regulations

**OSHA Hazard Communication Standard:** This material is classified as hazardous in accordance with OSHA 29 CFR 1910-1200.

**Toxic Substance Control Act (TSCA) Inventory:** All substances in this product are listed on the TSCA Inventory. This product is not subject to TSCA 12(b) Export Notification.

**Drug Enforcement Administration (DEA) List 2, Essential Chemicals (21 CFR 1310.02(b)) and 1310.4(f)(2)) and Chemical Code Number**  
No listing

**Drug Enforcement Administration (DEA) Lists 1 & 2, Exempt Chemical Mixtures (21 CFR 1310.12(c)) and Code Number:** No listing

**Department of Homeland Security (DHS) Chemical Facility Anti-Terrorism Standards (CFATS) Chemicals:** No listing

#### **Superfund Amendments and Reauthorization Act (SARA)**

**SARA Section 311/312 Hazard Categories:** Combustible liquid Causes serious eye irritation

**SARA 313 Information:** None of the components of this product are subject to reporting requirements of Section 313 of the Emergency Planning and Community Right-to Know Act of 1986.

**SARA 302/304 Extremely Hazardous Substance:** None of the components of this product exceed the threshold (de minimis) reporting levels established by these sections of Title III of SARA.

**SARA 302/304 Emergency Planning & Notification:** None of the components of this product exceed the threshold (de minimis) reporting levels established by these sections of Title III of SARA.

**Comprehensive Response Compensation and Liability Act (CERCLA):** No components of the product exceed the threshold (de minimis) reporting levels for hazardous wastes established by CERCLA.

#### **Clean Air Act (CAA)**

This product does not contain any Hazardous Air Pollutants (HAPs) designated in CAA Section 112 (b).

This product does not contain Class 1 ozone depleters.

This product does not contain Class 2 ozone depleters.

#### **Clean Water Act (CWA)**

This product does not contain any Hazardous Substances listed under the CWA.

This product does not contain any Priority Pollutants.

This product does not contain any Toxic pollutants.

#### U.S. State Regulations

##### **California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986**

This product contains no chemical(s) known to the state of California to cause cancer birth defects or reproductive harm in concentrations that exceed the threshold (de minimis) reporting levels established under Proposition 65.

##### **Other U.S. State Inventories**

Methyl Acetoacetate (CAS #105-45-3) is listed on the following State Hazardous Substance Inventories, Right-to-Know lists and/or Air Quality/Air Pollutants lists: PA.

#### Canada

**WHMIS Hazard Classification:** No data available

**Canadian National Pollutant Release Inventory (NPRI):** None of the components of this product are listed on the NPRI.

#### European Economic Community

**WGK, Germany (Water danger/protection):** 1 (slightly hazardous to water)

#### **Global Chemical Inventory Lists**

Country	Inventory Name	Listed
Canada	Domestic Substance List (DSL)	Yes
Canada	Non-Domestic Substance List (NDSL)	No
Europe	Inventory of New and Existing Chemicals (EINECS)	Yes
United States	Toxic Substance Control Act (TSCA)	Yes
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
New Zealand	New Zealand Inventory of Chemicals (NZIoC)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (KECI)	Yes
Philippines	Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Yes

\*Yes - All components of this product comply with the inventory requirements administered by the governing country.  
No - One or more components of this product are not on the inventory or are exempt from listing.

## 15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

## SECTION 16 - OTHER INFORMATION

### Hazardous Material Information System (HMIS)

HEALTH	2
FLAMMABILITY	2
PHYSICAL HAZARD	0
PERSONAL PROTECTION	C

C = safety glasses & gloves  
& apron

#### HMIS Hazard Rating Legend

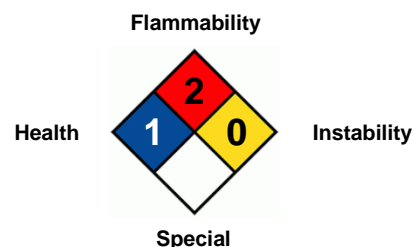
0 = Minimal 1 = Slight 2 = Moderate  
3 = Serious 4 = Severe

\* = Chronic Health Hazard

#### NFPA Hazard Rating Legend

0 = Insignificant 1 = Slight 2 = Moderate  
3 = High 4 = Extreme

### National Fire Protection Association (NFPA)



### Abbreviation Key

<b>ACGIH</b>	American Conference of Governmental Industrial Hygienists	<b>LD<sub>50</sub></b>	Lowest Lethal Dose
<b>ADR</b>	Accord Dangereux Routier (European regulations concerning the international transport of dangerous goods by road)	<b>mppcf</b>	Millions of Particles Per Cubic Foot
<b>CAS</b>	Chemical Abstract Services	<b>NA</b>	North America
<b>CFR</b>	Code of Federal Regulations	<b>NAERG</b>	North American Emergency Response Guide Book
<b>COC</b>	Cleveland Open Cup	<b>NIOSH</b>	National Institute for Occupational Safety & Health
<b>DOT</b>	Department of Transportation	<b>NTP</b>	National Toxicology Program
<b>EC<sub>50</sub></b>	Half maximal effective concentration	<b>OSHA</b>	Occupational Safety and Health Administration
<b>EMS</b>	Emergency Response Procedures for Ships Carrying	<b>PBT</b>	Persistent, Bioaccumulating and Toxic
<b>EPA</b>	Environmental Protection Agency	<b>PEL</b>	Permissible exposure limit
<b>ErC<sub>50</sub></b>	Reduction of Growth Rate	<b>PMCC</b>	Pensky-Martens Closed Cup
<b>ERG</b>	Emergency Response Guide Book	<b>ppm</b>	Parts Per Million
<b>FDA</b>	Food and Drug Administration	<b>RCRA</b>	Resource Conservation and Recovery Act
<b>GHS</b>	Globally Harmonized System of Classification and Labelling of Chemicals (GHS)	<b>RID</b>	Dangerous Goods by Rail
<b>HCS</b>	Hazard Communication Standard	<b>RQ</b>	Reportable Quantity
<b>IARC</b>	International Agency for Research on Cancer	<b>TCC/Tag</b>	Tagliabue Closed Cup
<b>IATA</b>	International Air Transport Association	<b>TLV</b>	Threshold Limit Value
<b>IC<sub>50</sub></b>	Half Maximal Inhibitory Concentration	<b>TSCA</b>	Toxic Substance Control Act
<b>ICAO</b>	International Civil Aviation Organization	<b>TWA</b>	Time-weighted Average
<b>IDLH</b>	Immediately Dangerous to Life and Health	<b>UN</b>	United Nations
<b>IMDG</b>	International Maritime Dangerous Goods	<b>VOC</b>	Volatile Organic Compounds
<b>IMO</b>	International Maritime Organization	<b>vPvB</b>	Very Persistent and Very Bioaccumulating
<b>LC<sub>50</sub></b>	50% Lethal Concentration	<b>WHMIS</b>	Workplace Hazardous Materials Information System
<b>LD<sub>50</sub></b>	50% Lethal Dose		

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