

SECTION 1: CHEMICAL PRODUCT and COMPANY IDENTIFICATION

Catalog No.
L14193

Product Name: **Benzyl chloroformate, 95%**
Synonyms: Carbobenzoxy chloride, Cbz-chloride, Chloroformic acid benzyl ester, 2-ch

Manufacturer/Supplier Name: Alfa Aesar - A Johnson Matthey Company
Address: 30 Bond St.
Ward Hill, MA 01835

Business Phone: 978-521-6300
Business Fax: 978-521-6350
For information in North America, call: 978-521-6300

CHEMTREC Numbers:
For emergencies in the US, call CHEMTREC: 800-424-9300
For emergencies outside US, call INTERNATIONAL: (703)527-3887
For Nonemergency, call: (800)262-8200

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SECTION 2 : COMPOSITION, INFORMATION ON INGREDIENTS

Catalog No. L14193

Chemical Name Benzyl chloroformate
CAS# 501-53-1
% Weight (Typical) 95

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SECTION 3 : HAZARDS IDENTIFICATION

Catalog No. L14193

Emergency Overview: Corrosive. Lachrymatory. Environmental Hazard.

Benzyl chloroformate:

Route of Exposure: Eyes. Skin. Inhalation. Ingestion.

Potential Health Effects:

Eye Contact: Corrosive, contact causes severe eye burns which may result in permanent tissue and corneal damage.

Skin Contact: Corrosive causes skin burns and severe irritation.

Inhalation: Corrosive. Toxic. Vapor is also strongly irritating to the respiratory tract. May be aspirated into lungs; risk of pulmonary edema (possibly delayed).

Ingestion: Will react with moisture with formation of corrosive products. Risk of serious internal burns if ingested.

Target Organs: Eyes. Skin. Respiratory system. G.I. Tract.

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SECTION 4 : FIRST AID MEASURES**Catalog No. L14193**

Eye Contact:	Immediately flush eyes with plenty of water for at least 20 minutes. Assure adequate flushing of the eyes by separating the eyelids with fingers. Get immediate medical attention if irritation persists, or symptoms of overexposure become apparent.
Skin Contact:	Immediately wash skin with plenty of water for at least 20 minutes, while removing contaminated clothing and shoes. Get medical attention especially, if irritation develops, persists, or symptoms of overexposure become apparent.
Inhalation:	Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Keep warm. Get immediate medical attention.
Ingestion:	If swallowed, call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. Do not induce vomiting unless instructed by medical personnel. Get medical attention.

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SECTION 5 : FIRE FIGHTING MEASURES**Catalog No. L14193**

Flash Point:	125°C (257°F)
Auto Ignition Temperature:	590°C (1094°F)
Extinguishing Media:	Use dry powder or carbon dioxide when fighting a fire involving this material.
Unsuitable Media:	Water extinguishers are not recommended.
Protective Equipment:	As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH (approved or equivalent) and full protective gear.

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SECTION 6 : ACCIDENTAL RELEASE MEASURES**Catalog No. L14193**

Personal Precautions:	Use proper personal protective equipment as listed in section 8.
Spill Cleanup Measures:	Clean up spills immediately, observing precautions in the Protective Equipment section. Absorb spill with dry inert material such as dry sand, earth, or vermiculite, then place in suitable container. Refer to section 13 for proper disposal.
Environmental Precautions:	Do not allow material to enter drains or streams.

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SECTION 7 : HANDLING and STORAGE**Catalog No. L14193**

Handling:	This product should be handled only by, or under the close supervision of, those properly qualified in the handling and use of potentially hazardous chemicals, who should take into account the fire, health and chemical hazard data. It should always be handled in an efficient fume hood or equivalent system. The user should consider that the toxicological and physiological properties of many compounds are not yet well determined and that new hazardous products may arise from reactions between chemicals. Care should be taken to prevent any chemical from coming into contact with the skin or eyes and from contaminating personal clothing.
Storage:	Store in a cold, below 5 degrees celcius, dry, well ventilated area away from sources of heat and incompatible substances. Keep container tightly closed and cold when not in use. Product is moisture sensitive.
Hygiene Practices:	Wash thoroughly after handling. Avoid contact with eyes and skin. Avoid inhaling vapor or mist.

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SECTION 8 : EXPOSURE CONTROLS, PERSONAL PROTECTION**Catalog No. L14193**

Engineering Controls:	Use appropriate engineering control such as process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Where such systems are not effective wear suitable personal protective equipment, which performs satisfactorily and meets OSHA or other recognized standards. Consult with local procedures for selection, training, inspection and maintenance of the personal protective equipment.
Skin Protection Description:	Wear suitable protective clothing to prevent contact with skin.
Hand Protection Description:	Wear appropriate protective gloves. Consult glove manufacturers for glove permeability data.
Eye/Face Protection:	Wear appropriate protective glasses or splash goggles as described by 29 CFR 1910.133, OSHA eye and face protection regulation, or the European standard EN 166.
Respiratory Protection:	A NIOSH approved air-purifying respirator with an appropriate cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited to airborne concentrations that are typically within 10 times the exposure limit. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.
Other Protective:	Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

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SECTION 9 : PHYSICAL and CHEMICAL PROPERTIES**Catalog No. L14193**

Physical State/Appearance:	Liquid
Color:	Colorless
Odor:	Acrid
Vapor Pressure:	0.33 mbar @ 20°C (68°F)
Flash Point:	125°C (257°F)
Auto Ignition Temperature:	590°C (1094°F)
Boiling Point:	178-180°C (352.4-356°F)
Melting Point:	-20°C (-4°F)
Solubility in Water:	Reacts
Density:	1.195
Dynamic Viscosity:	2.57 mPa.s @ 20°C (68°F)
Molecular Formula:	C ₈ H ₇ ClO ₂
Molecular Weight:	170.60

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SECTION 10 : STABILITY and REACTIVITY**Catalog No. L14193**

Chemical Stability:	Stored over sodium carbonate. Thermally unstable; initial decomposition temperature 50°C.
Conditions to Avoid:	High temperatures, flames and sparks. Humidity.
Incompatibilities with Other Materials:	Strong oxidizing agents. Reducing agents. Bases. Amines. Alcohols. Water.
Possible Decomposition Product:	Carbon monoxide. Hydrogen chloride.

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SECTION 11 : TOXICOLOGICAL INFORMATION**Catalog No. L14193****Benzyl chloroformate :**

Eye Effect: No data reported in the cited references as of the revision date.
Skin Effects: No data reported in the cited references as of the revision date.
Ingestion Effects: Oral - rat LD50: 2300 mg/kg (Supplier data)
Inhalation Effects: Inhalation - rat LC50: 0.59 mg/L/4H (Supplier data)

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SECTION 12 : ECOLOGICAL INFORMATION**Catalog No. L14193**

Ecotoxicity: EC/IC50 Daphnia spp. 400 mg/L/48H; LC50 Pimephales promelas 460 mg/L/96H (DOSE data for benzyl alcohol): EU classification: very toxic to aquatic organisms. May be harmful to aquatic organisms with the increasing pH shift.

Bioaccumulation: Not expected to bioaccumulate and/or bioconcentrate in aquatic organisms. Estimated BCF 4 (HSDB data for benzyl alcohol).

Biodegradation: Readily hydrolysed in moist air, soil and water to benzyl alcohol, carbon monoxide and hydrogen chloride. Benzyl alcohol is readily biodegradable in soil and water, BOD 92% after 14 days (DOSE), and vapor is readily photodegradable in the atmosphere, estimated half-life 48 hours (HSDB).

Environmental Stability: Hydrogen chloride may cause long term effects in the environment until neutralised.

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SECTION 13 : DISPOSAL CONSIDERATIONS**Catalog No. L14193**

Waste Disposal: Consult with the US EPA Guidelines listed in 40 CFR Part 261.3 for the classifications of hazardous waste prior to disposal. Furthermore, consult with your state and local waste requirements or guidelines, if applicable, to ensure compliance. Arrange disposal in accordance to the EPA and/or state and local guidelines, by a licensed disposal company.

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SECTION 14 : TRANSPORT INFORMATION**Catalog No. L14193**

DOT Shipping Name: Benzyl chloroformate
DOT Hazard Class: 8
DOT Identification Number: UN1739
DOT Packing Group: I
DOT Subpart E Labeling Requirement: 8

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Benzyl chloroformate :

TSCA 8(b): Inventory Status: Listed on the TSCA inventory.

TSCA 12(b): Export Notification None of the chemicals are listed under TSCA Section 12b.

State: Benzyl Chloroformate can be found on the following state right to know lists: New Jersey. California No Significant Risk Level: None of the chemicals in this product are listed.

Risk Phrases: R34 Causes burns.
R50/53 Very toxic to aquatic organisms, may cause long term adverse effects in the environment.

Safety Phrase: S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S45 In case of accident or if you feel unwell, seek medical advice immediately
S60 This material and its container must be disposed of as hazardous waste.
S61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

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MSDS Preparation Date: January 1, 2002, Version 1

MSDS Revision Date: April 14, 2003.

MSDS Author: Actio Corporation.

Disclaimer:

This Health and Safety Information is correct to the best of our knowledge and belief at the date of its publication but we cannot accept liability for any loss, injury or damage which may result from its use. We shall ensure, so far as is reasonably practicable, that any revision of this Data Sheet is sent to all customers to whom we have directly supplied this substance, but must point out that it is the responsibility of any intermediate supplier to ensure that such revision is passed to the ultimate user. The information given in the Data Sheet is designed only as a guidance for safe handling, storage and the use of the substance. It is not a specification nor does it guarantee any specific properties. All chemicals should be handled only by competent personnel, within a controlled environment. Should further information be required, this can be obtained through the sales office whose address is at the top of this data sheet. We welcome any additional information about our products that customers have obtained by personal experience.

References:

1. American Chemical Society, STN Easy Online Database
2. Brethericks Reactive Chemical Hazards Database. Version 2.
3. Gassarett and Doulls Toxicology, The Basic Science of Poisons.
4. Hawleys Condensed Chemical Dictionary, Thirteenth Edition
5. IARC monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, WHO International Research on Cancer.
6. Industrial Hygiene and Toxicology, by F.A. Patty.
7. National Library of Medicine, Department of Health and Human Services, Hazardous Substances Data Bank (HSDB).
8. National Toxicology Program (NTP) Eighth Report on Carcinogens, 1997.
9. NIOSH Registry of Toxic Effects of Chemical Substances (RTECS) and Pocket Guide to Chemical Hazards.
10. OSHA Hazard Communication Standard, 1910.1200 and Z Tables.
11. Sax Dangerous Properties of Industrial Materials. Tenth Edition.
12. The Merck Index: An Encyclopedia of Chemicals and Drugs. Merck and Company. Twelfth Edition 1998.
13. Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environmental and Biological Exposure Indices. TLV Booklet, 2001.

