



SAFETY DATA SHEET

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) (OSHA HCS)

SECTION 1. IDENTIFICATION

Product name : Benzyl Chloroformate (30-35% in Toluene)
Product code : C0176

Manufacturer or supplier's details

Company name of supplier : TCI America
Address : 9211 N. Harborage Street Portland, OR 97203 U.S.A.
Telephone : +1-800-4238616/+1-503-2831681
Telefax : +1-888-5201075/+1-503-2831987
E-mail address : sales-US@TCIchemicals.com

Chemical Emergencies: TCI America (8:00am - 5:00pm) PST +1-503-2867624

Transportation Emergencies: Chemtrec 24-Hour +1-800-4249300 (U.S.A.)/+1-703-5273887 (International)

Recommended use of the chemical and restrictions on use

Recommended use : Use as laboratory reagent

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids : Category 2
Corrosive to Metals : Category 1
Acute toxicity (Inhalation) : Category 4
Skin corrosion : Category 1B
Serious eye damage : Category 1
Reproductive toxicity : Category 1A
Specific target organ toxicity - single exposure : Category 1 (Central nervous system)
Specific target organ toxicity - single exposure : Category 3 (Respiratory system, Central nervous system)
Specific target organ toxicity - repeated exposure : Category 1 (Liver, Kidney, Central nervous system)
Aspiration hazard : Category 1
Short-term (acute) aquatic hazard : Category 2
Long-term (chronic) aquatic hazard : Category 1

GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements :
H225 Highly flammable liquid and vapor.
H290 May be corrosive to metals.
H304 May be fatal if swallowed and enters airways.
H314 Causes severe skin burns and eye damage.
H332 Harmful if inhaled.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.
H360 May damage fertility or the unborn child.
H370 Causes damage to organs (Central nervous system).
H372 Causes damage to organs (Liver, Kidney, Central nervous system) through prolonged or repeated exposure.
H401 Toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements : **Prevention:**

P201 Obtain special instructions before use.
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.

P233 Keep container tightly closed.

P234 Keep only in original container.

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P271 Use only outdoors or in a well-ventilated area.

P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

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/ doctor.

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/ doctor.

P307 + P311 IF exposed: Call a POISON CENTER or doctor/ physician.

P363 Wash contaminated clothing before reuse.

P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

P390 Absorb spillage to prevent material damage.

P391 Collect spillage.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

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

P405 Store locked up.

P406 Store in corrosive resistant container with a resistant inner liner.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS RN	Concentration (% w/w)
Toluene	108-88-3	>= 70 - < 90
Benzyl Chloroformate	501-53-1	>= 30 - < 50

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

If inhaled	:	Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
In case of skin contact	:	Take off all contaminated clothing immediately. If on skin, rinse well with water. Call a POISON CENTER or doctor/ physician.
In case of eye contact	:	Rinse with plenty of water. If easy to do, remove contact lens, if worn. Immediately call a POISON CENTER or doctor/ physician.
If swallowed	:	Immediately call a POISON CENTER or doctor/ physician. Rinse mouth. Do NOT induce vomiting.
Most important symptoms and effects, both acute and delayed	:	None known.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Dry powder, Foam, Water spray, Carbon dioxide (CO ₂)
Specific hazards during fire fighting	:	No information available.
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Immediately evacuate personnel to safe areas. Remove undamaged containers from fire area if it is safe to do so.
Special protective equipment for fire-fighters	:	Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Wear suitable protective equipment. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Entry to non-involved personnel should be controlled around the leakage area by roping off, etc.
Environmental precautions	:	Should not be released into the environment.
Methods and materials for containment and cleaning up	:	Collect as much of the spill as possible with a suitable absorbent material.

SECTION 7. HANDLING AND STORAGE

Technical measures	:	Prevent generation of vapor or mist. Take precautionary measures against static discharge. Use explosion-proof equipment.
Local/Total ventilation	:	Ensure adequate ventilation. Handle product only in closed system or provide appropriate exhaust ventilation at machinery. Use a local exhaust ventilation.
Advice on safe handling	:	Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not subject to grinding, shock or friction. Wash hands and face thoroughly after handling. Open drum carefully as content may be under pressure. Keep only in original packaging.
Conditions for safe storage	:	Keep container tightly closed. Store in a cool and shaded area. Keep in a well-ventilated place. Use explosion-proof equipment. Protect from moisture. Keep under inert gas. Store locked up.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS RN	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Toluene	108-88-3	TWA	20 ppm	ACGIH
		TWA	100 ppm 375 mg/m ³	NIOSH REL
		ST	150 ppm 560 mg/m ³	NIOSH REL
		TWA	200 ppm	OSHA Z-2
		CEIL	300 ppm	OSHA Z-2
		Peak	500 ppm (10 minutes)	OSHA Z-2
		TWA	100 ppm	OSHA P0

			375 mg/m ³	
		STEL	150 ppm 560 mg/m ³	OSHA P0

Biological occupational exposure limits

Components	CAS RN	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Toluene	108-88-3	Toluene	In blood	Prior to last shift of work-week	0.02 mg/l	ACGIH BEI
		Toluene	Urine	End of shift (As soon as possible after exposure ceases)	0.03 mg/l	ACGIH BEI
		o-Cresol	Urine	End of shift (As soon as possible after exposure ceases)	0.3 mg/g creatinine	ACGIH BEI

Engineering measures : Install a closed system or local exhaust. Also install safety shower and eye bath.

Personal protective equipment

Respiratory protection : Gas mask, Self-contained breathing apparatus

Hand protection : Impervious gloves

Eye protection : Safety glasses, Safety goggles, Face-shield

Skin and body protection : Impervious protective clothing

*Use personal protective equipment (PPE) approved under appropriate government standards and follow local and national regulations.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Color	: colorless
Odor	: No data available
Odor Threshold	: No data available
pH	: No data available
Melting point/freezing point	: No data available
Boiling point/boiling range	: No data available
Flash point	: No data available
Flammability (solid, gas)	: No data available
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available
Vapor pressure	: No data available
Relative vapor density	: No data available
Relative density	: 0.96
Solubility(ies)	: No data available
Solubility in other solvents	: No data available
Partition coefficient: n-octanol/water	: No data available
Autoignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity	
Viscosity, dynamic	: No data available
Viscosity, kinematic	: No data available
Molecular weight	: 170.59 g/mol

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No data available
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: None under normal processing.
Conditions to avoid	: Electrical spark Open flame Electrostatic discharge Exposure to moisture.
Incompatible materials	: Oxidizing agents, Acids, Bases
Hazardous decomposition products	: Carbon monoxide, Carbon dioxide (CO ₂), Hydrogen chloride gas

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Components:

Toluene:

Acute oral toxicity	: LDLo (Humans): 50 mg/kg LD50 (Rat): 636 mg/kg
Acute inhalation toxicity	: LCLo (Humans): 15,000 mg/m ³ Exposure time: 1 h Test atmosphere: dust/mist LC50 (Rat): 49 g/m ³ Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	: LD50 (Rabbit): 12,267 mg/kg

Components:

Benzyl Chloroformate:

Acute oral toxicity	: LD50 (Rat): 3 g/kg
Acute inhalation toxicity	: LC50 (Rat): 590 mg/m ³ Exposure time: 4 h Test atmosphere: vapor

Skin corrosion/irritation

Product:

Result	: Causes burns.
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Components:

Toluene:

Result	: Skin irritation
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Components:

Benzyl Chloroformate:

Result	: Causes burns.
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Serious eye damage/eye irritation

Product:

Result	: Irreversible effects on the eye
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Components:

Toluene:

Result	: Mild eye irritation
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Components:

Benzyl Chloroformate:

Result	: Irreversible effects on the eye
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Respiratory or skin sensitization : No information available.

Germ cell mutagenicity : No information available.

Carcinogenicity

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

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

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

Reproductive toxicityProduct:

Reproductive toxicity - Assessment : Known human reproductive toxicant

Components:**Toluene:**

Reproductive toxicity - Assessment : Known human reproductive toxicant

STOT-single exposureProduct:

Assessment : May cause respiratory irritation., May cause drowsiness or dizziness.

Target Organs

Assessment : Central nervous system

Assessment : Causes damage to organs.

Components:**Toluene:**

Assessment : May cause respiratory irritation.

Target Organs

Assessment : Central nervous system

Assessment : Causes damage to organs.

STOT-repeated exposureProduct:

Target Organs : Liver, Kidney, Central nervous system

Assessment : Causes damage to organs through prolonged or repeated exposure.

Components:**Toluene:**

Target Organs : Liver, Kidney, Central nervous system

Assessment : Causes damage to organs through prolonged or repeated exposure.

Repeated dose toxicity**Aspiration toxicity**Product:

May be fatal if swallowed and enters airways.

Components:**Toluene:**

May be fatal if swallowed and enters airways.

RTECS No.: XS5250000 (Toluene)
LQ5860000 (Benzyl Chloroformate)**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity**Product:**Ecotoxicology Assessment**

Acute aquatic toxicity : Toxic to aquatic life.

Components:**Toluene:**Toxicity to fish : LC50 (Oryzias latipes (Japanese medaka)): 25 mg/l
Exposure time: 96 hToxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 4.1 mg/l
Exposure time: 48 hToxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 29 mg/l
Exposure time: 72 h**Ecotoxicology Assessment**

Acute aquatic toxicity : Toxic to aquatic life.

Chronic aquatic toxicity : This product has no known ecotoxicological effects.

Components:**Benzyl Chloroformate:****Ecotoxicology Assessment**

Acute aquatic toxicity : Very toxic to aquatic life.
Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Persistence and degradability

No data available

Bioaccumulative potential**Components:****Toluene:**

Partition coefficient: n-octanol/water : 2.73

Components:**Benzyl Chloroformate:**

Partition coefficient: n-octanol/water : 1.84

Mobility in soil**Components:****Toluene:**

Distribution among environmental compartments : Koc: 166

Other adverse effects**Product:**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : Disposal in accordance with local and national regulations. Take precautions against ignition or explode. Entrust disposal to a licensed waste disposal company.
Contaminated packaging : Disposal in accordance with local and national regulations. Before disposal of used container, remove contents completely.

SECTION 14. TRANSPORT INFORMATION**International Regulations****IATA-DGR**

UN/ID No. : UN 2920
Proper shipping name : Corrosive liquid, flammable, n.o.s.
Class : 8
Subsidiary risk : 3
Packing group : II

IMDG-Code

UN number : UN 2920
Proper shipping name : CORROSIVE LIQUID, FLAMMABLE, N.O.S.
Class : 8
Subsidiary risk : 3
Packing group : II

EmS Code : F-E, S-C
Marine pollutant : yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation**49 CFR**

UN/ID/NA number : UN 2920
Proper shipping name : Corrosive liquids, flammable, n.o.s.
Class : 8
Subsidiary risk : 3
Packing group : II
ERG Code : 132
Marine pollutant : no

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION**CERCLA Reportable Quantity**

Components	CAS RN	Component RQ (lbs)	Calculated product RQ (lbs)
Toluene	108-88-3	1000	1428
Toluene	108-88-3	100	100 (F005)

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 313 : The following components are subject to reporting levels established
by SARA Title III, Section 313:
Toluene 108-88-3 >= 70 - < 90 %

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 112 (40 CFR 61):

Toluene 108-88-3 >= 70 - < 90 %

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489):

Toluene 108-88-3 >= 70 - < 90 %

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

Toluene 108-88-3 >= 70 - < 90 %

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Toluene 108-88-3 >= 70 - < 90 %

This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

Toluene 108-88-3 >= 70 - < 90 %

US State Regulations**Massachusetts Right To Know**

Toluene 108-88-3

Pennsylvania Right To Know

Toluene 108-88-3
Benzyl Chloroformate 501-53-1

Maine Chemicals of High Concern

Toluene 108-88-3

Vermont Chemicals of High Concern

Toluene 108-88-3

Washington Chemicals of High Concern

Toluene 108-88-3

California Prop. 65

WARNING: This product can expose you to chemicals including Toluene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances

Toluene 108-88-3

California Permissible Exposure Limits for Chemical Contaminants

Toluene 108-88-3

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Revision Date : 10/30/2024

This SDS was prepared sincerely based on the information obtained, however, any warranty shall not be given regarding the data contained and the assessment of hazards and toxicity. Prior to use, please investigate not only the hazards and toxicity information but also the laws and regulations of the organization, area and country where the products are to be used, which shall be given the first priority. The products are supposed to be used promptly after purchase in consideration of safety. Some new information or amendments may be added afterwards. If the products are to be used far behind the expected time of use or you have any questions, please feel free to contact us. The stated cautions are for normal handling only. In case of special handling operations, sufficient care should be taken, in addition to the safety measures suitable for the given situation. All chemical products should be treated with the recognition of "having unknown hazards and toxicity", which differ greatly depending on the conditions and handling when in use and/or the conditions and duration of storage. The products must be handled only by those who are familiar with specialized knowledge and have experience or under the guidance of those specialists throughout use from opening to storage and disposal. Safe usage conditions shall be set up on each user's own responsibility.