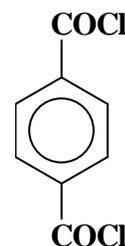




DuPont Protection Technologies



Terephthaloyl Chloride (TCL)

p-Phthaloyl Chloride

CAS Reg. No. 100-20-9

Terephthaloyl chloride (TCL) is a difunctional acid chloride with a variety of uses in polymer and fiber applications. It is offered in flake form in drums, and as molten liquid in bulk. TCL flakes consist of free-flowing white flakes, uniform in size and appearance. TCL molten is a clear water-white liquid substantially free of insoluble impurities. TCL is soluble in methylene chloride and many other organic solvents. Mixes of isophthaloyl chloride (ICL) and terephthaloyl chloride (TCL) are available on request.

finds use as an ingredient in microencapsulation, and as a water scavenger.

ICL/TCL Blends

DuPont is uniquely capable of supplying mixes of the acid chlorides, ICL and TCL. These mixes in varying proportions are used in porous membranes and as polymer intermediates.

Contact DuPont for further information on terephthaloyl chloride (TCL) or ICL/TCL blends.

Specifications

TCL Flakes

Terephthaloyl Chloride, % min.	99.75
Isophthaloyl Chloride, ppm max.	700

TCL Molten

Terephthaloyl Chloride, % min.	99.75
Isophthaloyl Chloride, ppm max.	700
Total monofunctionals, ppm max.	1,600
p-Cymene, ppm max.	30

Typical Physical Properties*

Property	Typical Value
Molecular Weight	203.0
Specific Gravity at 100°C (212°F)	1.34
Boiling Point (760 mm Hg), °C (°F)	265 (509)
Melting Point, C° (F°)	81.5-83.0 (179-181)
Vapor Pressure, mm Hg (solid)	@ 25°C 0.02
(solid)	@ 37°C 0.06
(solid)	@ 100°C 1.8
(212°F)	
Viscosity, Centipoise	@ 90 °C 1.34
	@ 150 °C 0.78
	@ 200 °C 0.50
Flash Point, SFCC, °C (°F)	180 (356)
Formula	C ₆ H ₄ (COCl) ₂

Uses and Benefits

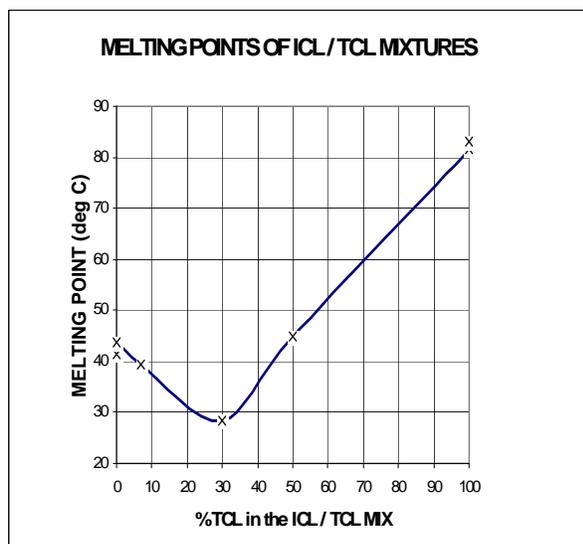
TCL is used as an intermediate in the manufacture of Aramid fibers and various polymers including polycarbonates, polyesters and polyarylates. TCL imparts strength, temperature stability, chemical resistance, and flammability resistance. TCL also

* These properties are drawn from various DuPont and other literature sources. DuPont does not make any warranty, express or implied, that future production will demonstrate these typical properties.

Formulating Information

New physical properties can be obtained for products that use ICL and TCL by using various blends of ICL / TCL. The following table shows the melting points of ICL / TCL mixtures that can be provided by special request.

Melting Properties of ICL / TCL Mixtures



Personal Safety and First Aid

Health Hazards

Terephthaloyl chloride strongly irritates the eyes, skin and lungs. Terephthaloyl chloride vapor or dust can react with moisture in the air or lungs to give hydrogen chloride and insoluble terephthalic acid, both of which can cause skin and eye burns and lung irritation.

DuPont recommends that terephthaloyl chloride be used in a closed system and human contact be avoided if possible. Where contact cannot be avoided, suitable personal protective equipment must be worn. Air contamination should be reduced to the lowest level practical. Du Pont recommended exposure limits can be found in the latest DuPont TCL Safety Data Sheet (SDS).

Safety Precautions

Avoid contact of terephthaloyl chloride with eyes, skin, and clothing. Avoid breathing vapor or dust.

Use terephthaloyl chloride in a closed system with adequate external ventilation.

First Aid

In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician. For skin, wash thoroughly with plenty of soap and water. Call a physician. Wash contaminated clothing before reuse. See the latest DuPont TCL Safety Data Sheet for additional information.

Personal Protective Equipment

The following personal protective equipment should be available and worn as appropriate for the exposure conditions: hard hat with brim; safety glasses (side shields preferred); chemical splash goggles; full length face shield; safety shoes; butyl rubber or nitrile rubber gauntlet gloves if liquid contact is possible, neoprene gloves for routine work; butyl rubber apron; butyl rubber jacket, pants, and footwear; approved respiratory protection. See the latest DuPont TCL Safety Data Sheet for additional information.

When working in an area where terephthaloyl chloride is completely enclosed in process equipment, wear usual work clothes, hard hat, safety glasses with side shields or chemical splash goggles, safety shoes and Neoprene® gloves.

When sampling flaked material in an area with good ventilation, add face shield and butyl rubber apron to the above dress. When sampling molten material or when connecting or disconnecting product or vent lines on tank trucks or cars, wear full butyl rubber chemical-proof suit and hood, gloves and overshoes.

In any situation where contact with vapor or liquid cannot be avoided, wear respiratory protection with breathing air supply, along with a full butyl rubber chemical-proof suit, hood, gloves and overshoes.

STORAGE AND HANDLING

Terephthaloyl chloride is corrosive to steel. It is handled hot as a liquid with a freezing point of 81.5-83 °C (179-181 °F). It will burn and is thermally stable at temperatures up to 365 °C (688 °F). Exposure of terephthaloyl chloride to high temperatures or contact with water may release hazardous hydrogen chloride gas (hydrochloric acid).

Steel storage tanks with Heresite[®], phenolic linings are satisfactory for bulk storage. Tanks should be heated with external steam heating panels, an oil circulation system or electrical tracing and insulated to allow control of tank contents in the range of 100 to 110 °C (212-230 °F), approximately 20 °C (36 °F) above the freezing point. Tanks should not be heated with steam jackets to avoid possible contact of steam with terephthaloyl chloride through defects in the tank wall. Type 316L or Carpenter 20 stainless steel may be used for valves, piping and pumps. If iron pickup by the product is a problem, either Teflon[®] lined piping or Inconel[®] 600 should be considered for the piping system. The piping system and pumps should be heated and insulated to avoid freezing of the product. Since many plastics are dissolved by this product, Teflon[®] TFE or FEP fluorocarbon resins are the preferred materials for gaskets and packing. Storage tanks should be blanketed with nitrogen to protect product quality.

Terephthaloyl chloride is toxic (see PERSONAL SAFETY AND FIRST AID) and should be handled in totally enclosed equipment where possible, or in systems designed to avoid human contact. Where contact cannot be avoided, suitable personal protective equipment must be worn. In the event of a spill or a leak, admission to the area should be limited to trained personnel wearing full protective equipment, such as a butyl rubber chemical-proof air suit, with breathing air supplied.

Storage and Shelf Life

Terephthaloyl chloride flakes are stable for at least two years if stored properly in the original unopened containers. Drums should be stored in a cool, well-ventilated area, separated from other combustible and readily oxidizable materials, and the drums protected from physical damage. Fire protection with an automatic or remotely controlled sprinkler system or water deluge system should be considered.

Drum Handling

Drums of flaked TCL should be opened and the contents transferred in a location provided with positive, forced ventilation so that contact with the product by personnel emptying drums is avoided. Used drums should be washed free of organic material before disposal.

Personnel handling drums, including those washing empty drums should wear proper personal protective equipment (see PERSONAL SAFETY AND FIRST AID). Care must be taken to avoid contact of eyes,

skin or clothing with this product. At the end of each shift, work clothes should be laundered and each operator should shower.

Hazard in Case of Fire

Molten terephthaloyl chloride is a Class IIIB combustible liquid (US Classification). Its flash point of 180 °C (356 °F) is above the temperatures at which it is normally stored and handled. However, terephthaloyl chloride should be used and stored in areas of minimum fire hazard and protected from flames, sparks, and excessive heat. Storage tanks and equipment should be electrically grounded. In the event of fire, fire-fighting personnel should wear respiratory protection with breathing air supplied and fight fires from upwind. Use water spray, foam, carbon dioxide, or dry chemicals to extinguish fires. Water or foam may cause frothing, so use with caution. Use water to cool containers or vessels exposed to fire. Exposure to water or intense heat will result in release of hazardous hydrochloric acid gas.

Smoke and fumes may be harmful when inhaled or in contact with the skin and therefore must be avoided. When contact with smoke and fumes cannot be avoided, wear full protective equipment, such as a butyl rubber chemical-proof air suit, with breathing air supplied.

Leaks and Spills

Leaks and spills should be cleaned up promptly. Hazardous hydrochloric acid gas and terephthaloyl chloride fumes may be present in the spill area. Keep all unprotected personnel far removed and upwind of the contaminated area. The leak or spill may be contained with a dam of dry absorbent material. Allow the molten material to solidify and shovel the solid material into steel drums for disposal or recovery. If the material came into contact with moisture, it should be shoveled into a plastic container to avoid HCl that may have been generated from corroding a metal drum. The container should not be covered until any HCl present can be neutralized to avoid pressurizing the container. After the solids are cleaned up, flush the spill area with water. The spill area and washings may be neutralized with soda ash. Wear full protective equipment, such as a butyl rubber chemical-proof air suit, with breathing air supplied, to avoid contact with the product.

Hazard Classifications

See the latest DuPont TCL Safety Data Sheet for hazards classification information.

Waste Disposal

Comply with federal, state, and local regulations. If approved, it may be incinerated, sent to an approved hazardous material disposal area, or transferred to a disposal contractor.

Packages

Terephthaloyl Chloride flakes are available in 250 lb (113.4 kg) steel drums. Molten Terephthaloyl Chloride is shipped in tank trucks. Blends of ICL and TCL are available in tank trucks and tank cars.

Visit Our Website

For additional information on TCL and related products including product applications, visit our website: <http://www.dupont.com/specintermediates>.

Order Placement and Product Information

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852-2734 5345 (Hong Kong)
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E. I. DuPont India Ltd. 81-3-5521-2615
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DuPont Taiwan Ltd.

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