# Oregon Department of Human Services

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**TECHNICAL BULLETIN**

# HEALTH EFFECTS INFORMATION

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**ENVIRONMENTAL TOXICOLOGY SECTION**
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## TRICHLOROFLUOROMETHANE

**For More Information Contact:**

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## SYNONYMS

Fluorotrichloromethane; freon 11; fluorocarbon 11; frigen 11; genetron 11; F-11; propellant 11

## USES

Trichlorofluoromethane is a chlorofluorocarbon (CFC) which is commonly used as a refrigerant, a foaming or blowing agent in industry, a solvent, an aerosol propellant, and in chemical syntheses.

## CHEMICAL AND PHYSICAL PROPERTIES

Trichlorofluoromethane is a colorless, odorless gas at normal temperatures and pressures. Under high pressures as in cans, tanks or refrigerators it is in liquid form. When released from a pressurized container it evaporates almost instantly and can cause freezing at the point of release. At very high concentrations in air it may smell like ether. It is slightly soluble in water but evaporates quickly if exposed to air. The chemical formula for Trichlorofluoromethane is $CFCL_3$.

## OCCURRENCE AND SOURCES OF TRICHLOROFLUOROMETHANE

Trichlorofluoromethane is man-made and its presence in the environment is due to releases from common household and industrial uses. It is extremely stable in the atmosphere and does not degrade naturally. It can also be produced as an industrial by-product wherever chlorine products are used; including small quantities which are formed by reaction of chlorine disinfectants with organic pollutants in water. It is released into the air by leaking refrigeration units and air conditioners and by spray paint, spray varnish, spray cosmetics and other sprays in which it has been used as a propellant. Since 1978 many uses of trichlorofluoromethane as a propellant have been prohibited by law in the U.S. It can still be used as a propellant in some specialized products used in businesses and industries. It may also be found in air emissions and waste waters from a number of industries particularly refrigeration, electronics and foam manufacturing.

## ENVIRONMENTAL FATE

Because of its extreme volatility trichlorofluoromethane evaporates into the air almost as soon as it is released. If released in surface water it evaporates very quickly (half-life of 4-5 hours in rivers.) Only if spilled in quantity as a liquid it

may escape into rapidly draining soils where it is protected from evaporation for months or even years. It may move about in soils and so may contaminate groundwater. Once in deep soils and ground water it does not diminish or degrade on its own. In the atmosphere trichlorofluoromethane remains unchanged for many years and accumulates there. This compound is believed to be very destructive to the stratospheric ozone layer.

## DRINKING WATER STANDARDS

The Department of Human Services, the U.S. Environmental Protection Agency has not adopted a mandatory limit (MCL-maximum contaminant level) for trichlorofluoromethane in drinking water. This compound is presently unclassified by EPA in terms of cancer causation. There is not enough study data on which to classify it. EPA has recommended that water containing more than 2 milligrams (2000 micrograms) of this compound per liter should not be used on a regular basis for human consumption.

## REMOVING TRICHLOROFLUOROMETHANE FROM DRINKING WATER

Best treatment technologies have not been established, but it is believed that aeration and activated carbon filtration would successfully remove the compound from water.