

NTP CHEMICAL REPOSITORY (RADIAN CORPORATION, AUGUST 29, 1991)

TRICRESYL PHOSPHATE

-IDENTIFIERS

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*CATALOG ID NUMBER: 000040

*CAS NUMBER: 1330-78-5

*BASE CHEMICAL NAME: TRICRESYLPHOSPHATE

*PRIMARY NAME: TRICRESYL PHOSPHATE

*CHEMICAL FORMULA: C₂₁H₂₁O₄P

*STRUCTURAL FORMULA: (CH₃C₆H₄)₃P(O)

*WLN: 1R XOPO&OR X1&OR X1

*SYNONYMS:

TRITOLYL PHOSPHATE

PHOSPHORIC ACID, TRITOLYL ESTER

CRESYL PHOSPHATE

TRIS(TOLYLOXY)PHOSPHINE OXIDE
PHOSPHORIC ACID, TRIS(METHYLPHENYL)ESTER
TRIS(METHYLPHENYL)ESTER OF PHOSPHORIC ACID
CELLUFLEX 179C
KRONITEX
LINDOL
TCP
DISFLAMOLL TKP
DURAD
FLEXOL PLASTICIZER TCP
FYRQUEL 150
IMOL S 140
NCI-C61041
PX-917
UN 2574
CELLUFLEX

-PHYSICAL CHEMICAL DATA

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*PHYSICAL DESCRIPTION: LITERATURE: Pale brown, almost colorless, liquid
REPOSITORY: Clear, light yellow, viscous liquid

*MOLECULAR WEIGHT: 368.37

*SPECIFIC GRAVITY: 1.162 @ 25/25 C [055]

*DENSITY: 1.247 g/mL @ 25 C [017,051]

*MP (DEG C): -25 to -30 C [055]

*BP (DEG C): 420 C [055]

*SOLUBILITIES:

WATER : <1 mg/mL @ 18 C (RAD)

DMSO : >=100 mg/mL @ 18 C (RAD)

95% ETHANOL : >=100 mg/mL @ 18 C (RAD)

METHANOL : Not available

ACETONE : >=100 mg/mL @ 18 C (RAD)

TOLUENE : Not available

OTHER SOLVENTS:

Common organic solvents and thinners: Miscible [033,058]

Linseed oil: Miscible [033]

Carbon tetrachloride: Very soluble [051]

Common vegetable oils: Miscible [058]

Ether: Soluble [017,051]

Alcohol: Soluble [017,051]

Benzene: Soluble [017,051]

Chloroform: Soluble [017]

China wood oil: Miscible [033]

Castor oil: Miscible [033]

***VOLATILITY:**

Vapor pressure: 0.1 mm Hg @ 155 C; 10 mm Hg @ 265 C [058]

Vapor density : 12.7 [055]

***FLAMMABILITY(FLASH POINT):**

This chemical has a flash point of 240.6 C (465 F) [058]. It is combustible. Fires involving this material can be controlled with a dry chemical, carbon dioxide or Halon extinguisher.

*UEL: Not available

LEL: Not available

***REACTIVITY:**

This chemical may soften or deteriorate some plastics and elastomers [058].

***STABILITY:**

This chemical will hydrolyze slowly under wet alkaline conditions at ambient temperatures. It reacts with air only at elevated temperatures [058].

*OTHER PHYSICAL DATA:

Specific gravity: 1.162 @ 20/20 C [058]

Boiling point: 244 C @ 3.5 mm Hg [017,051]; 265 C @ 10 mm Hg [033,275]

Specific heat: 0.38 [033]

Faint odor to odorless [058]

Refractive index: 1.55 @ 25 C [033]

Melting point also reported as 25-26 C [051]

Flash point also reported as 410 C (770 F) [033]

Pour point: -28 C [033]

Fire point: 363 C (685 F) [058]

Viscosity: 34 centipoise @ 37.8 [058]

-TOXICITY

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*NIOSH REGISTRY NUMBER: TD0175000

*TOXICITY:

typ.	dose	mode	specie	amount	units	other
	TDLo	orl	wmn	70	mg/kg/14D	
	LD50	orl	rat	5190	mg/kg	

LDLo	orl	dog	500	mg/kg
LD50	skn	cat	1500	mg/kg
LDLo	orl	rbt	100	mg/kg
LD50	orl	mus	3900	mg/kg

*AQTX/TLM96: Not available

*SAX TOXICITY EVALUATION:

THR: Poison by ingestion. Moderately toxic by skin contact. Human systemic effects by ingestion. Experimental reproductive effects. An eye and skin irritant.

*CARCINOGENICITY:

Status: NTP Carcinogenesis Studies; on test (two year studies), January 1990

*MUTATION DATA: Not available

*TERATOGENICITY: See RTECS printout for most current data

Reproductive Effects Data:

TDLo: orl-rat 90 gm/kg (90D male)
 TDLo: orl-rat 27 gm/kg (90D pre)
 TDLo: orl-mus 1750 mg/kg (7D male)
 TDLo: orl-mus 4464 mg/kg (7D male/7D pre-22D preg)
 TDLo: orl-mus 7250 mg/kg (7D pre/1-22D preg)
 TDLo: orl-mus 2250 mg/kg (7D male/7D pre-22D preg)

*STANDARDS, REGULATIONS & RECOMMENDATIONS:

OSHA: None

ACGIH: None

NIOSH Criteria Document: None

NFPA Hazard Rating: Health (H): None

Flammability (F): None

Reactivity (R): None

*OTHER TOXICITY DATA:

Skin and Eye Irritation Data:

skn-rbt 500 mg open MLD

eye-rbt 500 mg/24H MLD

Standards and Regulations: DOT-IMO: Poison B; Label: Poison

Status: EPA TSCA Chemical Inventory, 1990

EPA TSCA 8(a) Preliminary Assessment Information, Final Rule

EPA TSCA Test Submission (TSCATS) Data Base, April 1990

-OTHER DATA (Regulatory)

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*PROPER SHIPPING NAME (IATA): Tricresyl phosphate

*UN/ID NUMBER: UN2574

*HAZARD CLASS: 6.1

SUBSIDIARY RISK: None

PACKING GROUP: II

*LABELS REQUIRED: Poison

*PACKAGING: PASSENGER: PKG. INSTR.: 610, Y610

MAXIMUM QUANTITY: 5 L, 1 L

CARGO : PKG. INSTR.: 612

MAXIMUM QUANTITY: 60 L

*SPECIAL PROVISIONS: None

*USES:

This compound is used as a plasticizer in vinyl plastics manufacturing, as a flame-retardant, as a solvent for nitrocellulose and in cellulose molding compositions. It is also used as an additive to extreme-pressure lubricants, as a nonflammable fluid in hydraulic systems, as a lead scavenger in gasoline, to sterilize certain surgical instruments, in polystyrene, in waterproofing, in common organic solvents and thinners, in linseed oil, in china wood oil and in castor oil.

*COMMENTS:

This compound is a mixture of isomeric tritolyl phosphates, usually excluding the very toxic ortho-isomer as much as possible [033]. The NTP Master Agreement lot contains less than 0.1% of the tri-ortho isomer.

-HANDLING PROCEDURES

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*ACUTE/CHRONIC HAZARDS:

This compound is toxic by inhalation, ingestion or by absorption through the skin [036]. It is an irritant of the skin and eyes [043]. It is also an irritant of the mucous membranes and respiratory tract [051]. When heated to decomposition it emits toxic fumes of phosphorus oxides [043,058]. It is a CHOLINESTERASE INHIBITOR in animals [058].

*MINIMUM PROTECTIVE CLOTHING:

If Tyvek-type disposable protective clothing is not worn during handling of this chemical, wear disposable Tyvek-type sleeves taped to your gloves.

*RECOMMENDED GLOVE MATERIALS:

GlovES+ Expert System Glove Types For The Neat (Undiluted) Chemical:

This chemical has not been tested for permeation by Radian Corporation; however, the GlovES+ expert system was used to extrapolate permeation test information from compounds in the same chemical class. The GlovES+ system uses permeation data from literature sources; therefore, extra safety margins should be used with the estimated protection time(s). If this chemical makes direct contact with your glove, or if a tear, puncture or hole develops, replace them at once.

The GlovES+ expert system is a tool that can help people better manage

protection from chemicals, however this tool cannot replace sound judgment nor make technical decisions. Our GlovES+ expert system is designed to offer initial advice and assistance in glove selection while the final glove selection should be made by knowledgeable individuals based on the specific circumstances involved.

Glove Type	Model Number	Thickness	Estimated Protection Time
Butyl rubber	North B-174	0.70 mm	480 min
Natural rubber	Ansell Conform 34205	0.18 mm	360 min
Neoprene	Edmont 29-840	0.43 mm	360 min
PVC	Edmont 34-100	0.19 mm	480 min

***RECOMMENDED RESPIRATOR:**

Where the neat test chemical is weighed and diluted, wear a NIOSH-approved half face respirator equipped with an organic vapor/acid gas cartridge (specific for organic vapors, HCl, acid gas and SO₂) with a dust/mist filter.

***OTHER:** Not available

***STORAGE PRECAUTIONS:**

You should store this chemical under ambient temperatures, and protect it from moisture. If possible, it would be prudent to store this compound under inert atmosphere.

***SPILLS AND LEAKAGE:**

If you spill this chemical, FIRST REMOVE ALL SOURCES OF IGNITION. Then, use absorbent paper to pick up all liquid spill material. Your contaminated clothing and absorbent paper should be sealed in a vapor-tight plastic bag for eventual disposal. Solvent wash all contaminated surfaces with 60-70% ethanol followed by washing with a soap and water solution. Do not reenter the contaminated area until the Safety Officer (or other responsible person) has verified that the area has been properly cleaned.

***DISPOSAL AND WASTE TREATMENT:** Not available

-EMERGENCY PROCEDURES

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***SKIN CONTACT:**

IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water.

IMMEDIATELY call a hospital or poison control center even if no symptoms (such as redness or irritation) develop.

IMMEDIATELY transport the victim to a hospital for treatment after washing the affected areas.

***INHALATION:**

IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. IMMEDIATELY call a physician and be prepared to transport the victim to a hospital even if no symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop.

Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Respirator Recommendation.

***EYE CONTACT:**

First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center.

Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician.

IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

***INGESTION:**

DO NOT INDUCE VOMITING. If the victim is conscious and not convulsing, administer a slurry of activated charcoal in water and simultaneously call a hospital or poison control center. IMMEDIATELY transport the victim to a hospital.

If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with

the head lower than the body. DO NOT INDUCE VOMITING. IMMEDIATELY transport the victim to a hospital.

*SYMPTOMS:

Symptoms of exposure to this compound include irritation of the skin and eyes, flaccid paralysis without anesthesia, motor activity changes and muscle weakness [043]. It may cause respiratory tract and mucous membrane irritation [051]. It may also cause serious damage of the nervous and digestive systems and muscular pain [036]. Other symptoms include gastrointestinal upset, discomfort in distal portions of the arms and legs, soreness, aching, numbness, headache, vertigo, loss of appetite, paresthesias and decrease of strength in the arms and legs [099]. It may cause vomiting, diarrhea and abdominal pain [051,346]. It may also cause weakness of the distal muscles progressing to foot drop, wrist drop, loss of plantar reflex and death from respiratory paralysis [301]. Exposure may also lead to tingling sensations of the hands and feet and cramps. Cholinesterase inhibition has occurred in animals [058].

-SOURCES

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