



# MATERIAL SAFETY DATA SHEET

**MSDS Number:** 00691  
**Product Name:** Durad® 125

**Effective Date:** 02/03/2006  
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## SECTION I - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Durad® 125  
**Supplier:** Chemtura USA Corporation  
**Address:** 199 Benson Road **City:** Middlebury  
**State:** Connecticut **Zip:** 06749  
**Emergency Telephone Number:** 1-800-949-5167  
**Information Telephone Number:** 1-765-497-6100 **Fax:** 1-765-497-6123  
**Chemtrec Phone:** 1-800-424-9300; **Internationally call 703-527-3887**  
**Effective Date:** 02/03/2006 **Supercede Date:** 11/22/2005  
**MSDS Prepared By:** Chemtura Product Safety Group  
**Synonyms:** Tricresyl phosphate; Tritolyl phosphate  
**Product Use:** Antiwear lubricant additive  
**Chemical Name:** Tricresyl phosphate  
**Chemical Family:** Phosphate

### *Additional Information*

Manufacturer:  
Great Lakes Chemical Corporation, A Chemtura Company  
P.O. Box 2200  
West Lafayette, Indiana 47996-2200

## SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS No.	%	EXPOSURE LIMITS
Tricresyl phosphate	1330785	100	Y (Hazardous) Not established (OSHA PEL TWA) Not established (OSHA PEL STEL) Not established (OSHA PEL CEIL) Not established (ACGIH TLV TWA) Not established (ACGIH TLV STEL) Not established (ACGIH TLV CEIL)

\*Indented chemicals are components of previous ingredient.

### *Additional Information*

No information available

## SECTION III - HAZARDS IDENTIFICATION

**Emergency Overview:** Colorless liquid  
No odor  
May cause mucous membrane and upper respiratory tract irritation.  
Mist generated by heat, violent agitation or spraying will irritate skin, eyes, nose, throat and respiratory system.

**Relevant Routes of Exposure:** Ingestion, inhalation and skin absorption

**Signs and Symptoms of Overexposure:** General reddening and irritation to the skin and eyes, mucous membrane irritation, upper respiratory tract irritation.

**Medical Conditions Generally Aggravated By Exposure:** None reported

**Potential Health Effects:** See Section XI for additional information.

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## SECTION III - HAZARDS IDENTIFICATION

<b>Eyes:</b>	May cause mild eye irritation.
<b>Skin:</b>	Not expected to be a hazard in normal industrial use.
<b>Ingestion:</b>	Not expected to be a hazard in normal industrial use.
<b>Inhalation:</b>	May cause mucous membrane and upper respiratory tract irritation.
<b>Chronic Health Effects:</b>	May cause adrenal, reproductive and developmental effects based on animal data.
<b><u>Carcinogenicity:</u></b>	
<b>NTP:</b>	No
<b>IARC:</b>	No
<b>OSHA:</b>	No
<b>ACGIH:</b>	No
<b>OTHER:</b>	No

### *Additional Information*

No information available

## SECTION IV - FIRST AID MEASURES

<b>Eyes:</b>	Flush with large volumes of water for at least 15 minutes. Get medical attention.
<b>Skin:</b>	While removing clothing, wash with large volumes of soap and water for at least 15 minutes. If irritation develops, get medical attention.
<b>Ingestion:</b>	If conscious, give person 1 to 2 glasses of water. Get medical attention immediately.
<b>Inhalation:</b>	Remove person to fresh air. Get medical attention.
<b>Antidotes:</b>	No information available
<b>Notes to Physicians and/or Protection for First-Aiders:</b>	May be irritating to skin, mucous membranes and eyes. Though an organophosphate, it has only extremely weak anticholinesterase activity which should not require specific treatment (e.g. atropine and cholinesterase regenerators). Treatment is supportive and symptomatic after terminating exposure through washing, emesis or lavage. If inhalation exposure is severe, observation for up to 72 hours for delayed onset of severe pulmonary edema should be considered.

### *Additional Information*

No information available

## SECTION V - FIRE FIGHTING MEASURES

<b>Flammable Limits in Air (% by Volume):</b>	Not available
<b>Flash Point:</b>	225 degrees C (437 degrees F)(PMCC)
<b>Autoignition Temperature:</b>	607 degrees C (1125 degrees F)
<b>Extinguishing Media:</b>	All conventional media are suitable.
<b>Fire Fighting Instructions:</b>	Wear a self-contained breathing apparatus and protective clothing to prevent skin and eye contact in fire situations.
<b>Unusual Fire and Explosion Hazards:</b>	Not flammable but combustible if exposed to external flame. No explosion hazard.
<b>Flammability Classification:</b>	Non-flammable liquid
<b>Known or Anticipated Hazardous Products of Combustion:</b>	Oxides of phosphorus Carbon monoxide and carbon dioxide

### *Additional Information*

No information available

## SECTION VI - ACCIDENTAL RELEASE MEASURES

<b>Accidental Release Measures:</b>	Wearing appropriate personal protective equipment, collect spill with the aid of an inert absorbent and place in suitable labeled containers for disposal.
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## SECTION VI - ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** See Section VIII.  
**Environmental Precautions:** No information available

### *Additional Information*

No information available

## SECTION VII - HANDLING AND STORAGE

**Handling:** Use appropriate personal protection equipment.  
Avoid eye, skin and clothing contact.  
Do not breathe mist or vapor.  
Avoid repeated and prolonged contact.  
Avoid the generation of aerosols from spraying, pouring or vigorous agitation whenever possible, particularly if product is heated. If the generation of airborne materials cannot be avoided, exhaust ventilation and/or personal protective equipment as described in section 8 should be used.

**Storage:** Store in a cool, dry, well-ventilated area away from incompatible materials.  
Keep container tightly closed.  
Protect containers against damage.

**Other Precautions:** Avoid contact of material with heat and open flame.

### *Additional Information*

No information available

## SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

**Engineering Controls:** Avoid the generation of airborne mist where possible. When processing at high temperatures, local exhaust ventilation or personal protective equipment as indicated below may be necessary to control exposure to a slightly irritating by product.

**Ventilation Requirements:** Use local ventilation to keep levels below established threshold values.  
Use mechanical ventilation for general area control.

**Personal Protective Equipment:**

**Eye/Face Protection:** Chemical safety goggles

**Skin Protection:** Gloves - butyl or nitrile rubber  
Clothing designed to minimize skin contact  
Wear an apron or impervious clothing and rubber boots if splashing is expected.

**Respiratory Protection:** Wear a NIOSH/MSHA approved organic cartridge respirator if misting or vapor occurs, or there is potential for airborne exposures to exceed established threshold values.  
Consult the OSHA respiratory protection information located at 29CFR 1910.134 and the American National Standard Institute's Practices of Respiratory Protection Z88.2.  
Wear a NIOSH/MSHA approved self-contained breathing apparatus in emergency situations.

**Other Protective Clothing or Equipment:** No information available

**Exposure Guidelines:** See Section II.

**Work Hygienic Practices:** Wash thoroughly after handling.  
Wash contaminated clothing before reuse.

### *Additional Information*

No information available

## SECTION IX - PHYSICAL & CHEMICAL PROPERTIES

**Appearance:** Colorless liquid **Percent Volatile:** 0

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## SECTION IX - PHYSICAL & CHEMICAL PROPERTIES

<b>Boiling Point:</b>	241 - 255 degrees C at 4 mm Hg	<b>pH Value:</b>	Not available
<b>Bulk Density:</b>	Not available	<b>pH Concentration:</b>	Not available
<b>Color:</b>	Colorless	<b>Physical State:</b>	Liquid
<b>Decomposition Temperature:</b>	>300 degrees C	<b>Reactivity in Water:</b>	Not water reactive
<b>Evaporation Rate:</b>	Not available	<b>Saturated Vapor Concentration:</b>	Not available
<b>Freezing Point:</b>	<-40 degrees C	<b>Softening Point:</b>	Not available
<b>Heat Value:</b>	Not available	<b>Solubility in Water:</b>	Insoluble
<b>Melting Point:</b>	Not available	<b>Specific Gravity or Density (Water=1):</b>	1.16 - 1.18 at 20 degrees C
<b>Molecular/Chemical Formula:</b>	C21H21O4P	<b>Vapor Density:</b>	Not available
<b>Molecular Weight:</b>	368.37	<b>Vapor Pressure:</b>	0.033 mmHg at 150 degrees C (302 degrees F)
<b>Octanol/Water Partition Coefficient:</b>	Not available	<b>Viscosity:</b>	70 cSt at 25 degrees C
<b>Odor:</b>	Odorless	<b>Volatile Organic Compounds:</b>	Not available
<b>Odor Threshold:</b>	Not available	<b>Water/Oil Distribution Coefficient:</b>	Not available
<b>Particle Size:</b>	Not available	<b>Weight Per Gallon:</b>	Not available

### Additional Information

No information available

## SECTION X - STABILITY AND REACTIVITY

<b>Stability:</b>	Stable under normal conditions of handling and use.
<b>Conditions to Avoid:</b>	Excessive heat and fire Hydrolysis in water produces phenols.
<b>Incompatibility With Other Materials:</b>	None known
<b>Hazardous Decomposition Products:</b>	Thermal decomposition may produce the following: Oxides of phosphorus Carbon monoxide and carbon dioxide
<b>Hazardous Polymerization:</b>	Will not occur
<b>Conditions to Avoid:</b>	None

### Additional Information

No information available

## SECTION XI - TOXICOLOGICAL INFORMATION

VALUE (LD50 OR LC50)	ANIMAL	ROUTES	COMPONENTS
>11.1 mg/L	Rat	Acute Inhalation	Tricresyl phosphate
>10,000 mg/kg	Rabbit	Acute Dermal	Tricresyl phosphate
>5,000 mg/kg	Rat	Acute Oral	Tricresyl phosphate

### Toxicological Information:

This product has low acute oral and dermal toxicity and is minimally irritating to the eyes and non-irritating to the skin. Product may be irritating to the respiratory system and mucous membranes.

Historical data on tricresyl phosphate have shown neurological effects, widely viewed by experts as resulting from varying levels of ortho-cresyl phosphates, known neurotoxins. However, recent data on tricresyl phosphate, low in ortho-cresyl phosphates, have not shown neurotoxic effects. Current Great Lakes Chemical Corporation branded products of tricresyl phosphate were evaluated for acute delayed neurotoxicity in hens orally administered a single dose of 2000 mg/kg of body weight. Brain NTE activity was minimally reduced in all samples tested, with NTE inhibition levels being <34%. According to EPA criteria (1994) NTE inhibition at levels <34% is considered not be of concern. One hen in one test group did show axonal degeneration in several sections of the peripheral nerve. However, significance of the observed low-grade isolated

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lesion to treatment is doubtful. Based on this data, it is concluded that this product would not possess inherent neurotoxic potential.

Administration of 0.1% or greater TCP in the diet to male and female mice resulted in impaired fertility in both sexes. There were dose-related histopathological effects on testes and adrenals. Sperm motility was reduced at dietary levels as low as 0.05% (62.5 mg/kg).

Tricresyl phosphate was evaluated for developmental toxicity and teratogenic potential by oral gavage (0, 20, 400, or 750 mg/kg/day) in mated female rats during Gestation Days 0-19. At doses of 100 mg/kg/day and higher, increased salivation was observed post dosing. At doses of 400 mg/kg/day alopecia (sparse amounts of hair) was observed on the ventral surface and hindlimbs as well as unkempt appearance. The maternal NOEL was identified at 20 mg/kg/day. Although fetal body weights were reduced compared to the control group at all dose levels (20, 100, 400, and 750 mg/kg/day), a developmental delay (incomplete ossification) was only identified at the highest dose tested of 750 mg/kg/day. Due to the effect on fetal body weights a NOEL for developmental effects could not be determined.

Other acute and chronic health hazards, as well as target organs, are unknown.

## *Additional Information*

Note: Epidemiology studies completed in 1977 and 1985 of current and former workers at the production facility where Kronitex, Durad, and natural and synthetic triaryl phosphate esters are manufactured have not demonstrated any unusual pattern of mortality or disease.

## SECTION XII - ECOLOGICAL INFORMATION

### **Ecological Information:**

LC50 in rainbow trout (96H) = 0.75 mg/L  
EC50 in daphnia magna (48H) = 146 ug/L  
NOEC in daphnia magna (48H) = 31 ug/L  
LC50 in fathead minnow (96H) >100 mg/L  
LC50 in bluegill sunfish (96H) = 7,000 mg/L  
NOAEL in Selenastrum capricornutum (96H) = 2,500 ug/L

Half life = 79.8 days (pH 4, 15 degrees C); 61.6 days (pH 4, 25 degrees C)

Half life = 49.4 days (pH 7, 15 degrees C); 44.4 days (pH 7; 25 degrees C)

Half life = 15.3 days (pH 9, 15 degrees C); 6.56 days (pH 9, 25 degrees C)

Avoid releasing to the environment.

## *Additional Information*

No information available

## SECTION XIII - DISPOSAL CONSIDERATIONS

### **Disposal Considerations:**

Dispose of waste at an approved chemical disposal facility in compliance with all current Local, State/Province, Federal/Canadian laws and regulations.

If the product was supplied in a single use container, care should be taken to dispose of the container in a responsible manner and in accordance with applicable regulations. Label precautions should be followed for any residual material in the container.

## *Additional Information*

No information available

## SECTION XIV - TRANSPORT INFORMATION

### **U.S. DOT**

### **Proper Shipping Name:**

Environmentally hazardous substances, liquid, n.o.s. (Tricresyl Phosphate less than 1% Ortho-Isomer)

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## SECTION XIV - TRANSPORT INFORMATION

<b>Hazard Class:</b>	9	<b>ID Number:</b>	UN3082
<b>Packing Group:</b>	III	<b>Labels:</b>	9, Marine Pollutant
<b>Special Provisions:</b>	8,IB3,T4,TP1,TP29, 146	<b>Packaging Exceptions:</b>	155
<b>Non-Bulk Packaging:</b>	203	<b>Bulk Packaging:</b>	241
<b>Passenger Air/Rail Limit:</b>	No Limit	<b>Air Cargo Limit:</b>	No Limit
<b>Vessel Stowage:</b>	A	<b>Other Stowage:</b>	N/A
<b>Reportable Quantity:</b>	N/A		

### AIR - ICAO OR IATA

<b>Proper Shipping Name:</b>	Environmentally hazardous substance, liquid, n.o.s. (Tricresyl Phosphate less than 1% Ortho-Isomer)		
<b>Hazard Class:</b>	9	<b>ID Number:</b>	UN3082
<b>Subsidiary Risk:</b>	N/A	<b>Packing Group:</b>	III
<b>Hazard Labels:</b>	Micellaneous, Marine Pollutant	<b>Packing Instructions:</b>	914;LQ Y914
<b>Air Passenger Limit Per Package:</b>	See Below	<b>Packing Instruction - Cargo:</b>	914
<b>Air Cargo Limit Per Package:</b>	No Limit	<b>Special Provisions Code:</b>	A97

### WATER - IMDG

<b>Proper Shipping Name:</b>	Environmentally hazardous substance, liquid, n.o.s. (Tricresyl Phosphate less than 1% Ortho-Isomer)		
<b>Hazard Class:</b>	9	<b>ID Number:</b>	UN3082
<b>Packing Group:</b>	III	<b>Subsidiary Risk:</b>	N/A
<b>Medical First Aid Guide Code:</b>	NA		

### *Additional Information*

Air Maximum Net Quantity: No Limit; LQ 30 kg G

Emergency Procedures Code: F-A, S-F

Marine Pollutant

## SECTION XV - REGULATORY INFORMATION

### **U.S. Federal Regulations:**

The components of this product are either on the TSCA Inventory or exempt (i.e. impurities, a polymer complying with the exemption rule at 40 CFR 723.250) from the Inventory.

### **State Regulations:**

New Jersey Right To Know Hazardous Substance List (1% reporting limit)

### **International Regulations:**

This material (or each component) is listed on the following inventories:

Canada - DSL  
EU - EINECS  
Australia - AICS  
Japan - ENCS  
Korea - ECL  
Philippines - PICCS  
China - List I

Canadian Disclosure List (1%) - Tricresyl phosphate

Canadian WHMIS Hazard Class and Division = D.2.a, D.2.b.

### **SARA Hazards:**

<b>Acute:</b>	Yes	<b>Chronic:</b>	Yes
<b>Reactive:</b>	No	<b>Fire:</b>	No
<b>Pressure:</b>	No		

### *Additional Information*

The above regulatory information represents only selected regulations and is not meant to be a complete list.

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## SECTION XVI - OTHER INFORMATION

### NFPA Codes:

Health: 1  
Reactivity: 0

Flammability: 1  
Other: 0

### HMIS Codes:

Health: 1\*  
Reactivity: 0

\* indicates chronic health hazard.

Flammability: 1  
Protection: X

### Label Statements:

Not available

### Other Information:

Abbreviations:

(L) = Loose bulk density in g/ml

LOEC = Lowest observed effect concentration

MATC = Maximum acceptable toxicant concentration

NA = Not available

N/A = Not applicable

NL = Not limited

NOAEL = No observable adverse effect level

NOEC = No observed effect concentration

NOEL = No observable effect level

NR = Not rated

(P) = Packed bulk density in g/ml

PNOR = Particulates Not Otherwise Regulated

PNOS = Particulates Not Otherwise Specified

REL = Recommended exposure limit

TS = Trade secret

### *Additional Information*

Information on this form is furnished solely for the purpose of compliance with OSHA's Hazard Communication Standard, 29CFR 1910.1200 and the Canadian Hazardous Products Act and associated Controlled Products Regulations and shall not be used for any other purpose.