



**RADCOLUBE® FR457 HYDRAULIC FLUID
MATERIAL SAFETY DATA SHEET**

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product Name

RADCOLUBE® FR457 HYDRAULIC FLUID, FIRE RESISTANT

Meets Military Specification MIL-PRF-19457D (SH)

Qualification# Not Required

NSNs: 9150-01-113-2045, 9150-01-113-2046, 9150-01-113-2047

Company Identification

Radco Industries Inc.

PO BOX 305

LaFox, IL 60147

ISO 9001:2000 Certification Number: C2009-00209

Customer information number: 1-630-232-7966

Shipping emergency or off hour rush orders number: 1-630-336-6728

EMERGENCY TELEPHONE NUMBER

Advisory Office in case of poisoning:

Chemtrec (North America): 1-800-424-9300

Chemtrec al (International): 1-703-527-3887

SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	% Content	CAS
t-Butylphenyl diphenyl phosphate	30-35%	56803-37-3
Bis(t-butylphenyl) phenyl phosphate	30- 35%	65652-41-7
Tri(t-butylphenyl) phosphate	10- 15%	78-33-1
Triphenyl phosphate	15-25%	115-86-6

SECTION 3. HAZARDS IDENTIFICATION

Emergency Overview

Caution! Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation. Harmful if aspirated into the lungs.

Potential Health Effects

Eye

No significant irritation expected.

Ingestion

Significant adverse health effects are not expected if small amounts (less than a mouthful) are swallowed.

Inhalation

Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

Skin Contact

No significant irritation expected.

**SECTION 3. HAZARDS IDENTIFICATION continued****HMIS**

Health: 1	Fire: 1	Reactivity: 0
-----------	---------	---------------

NFPA Codes

Health: 1	Fire: 1	Reactivity: 0
-----------	---------	---------------

SECTION 4. FIRST AID MEASURES**Eyes**

Immediately flush eyes with plenty of running water. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids with water. Get medical attention if irritation persists.

Ingestion

If swallowed, drink plenty of water, DO NOT induce vomiting. Immediately call a doctor.

Inhalation

If adverse effects occur, remove to uncontaminated area.

Skin

Immediately remove contaminated clothing and equipment. Thoroughly wash all affected areas with soap and plenty of water. Get medical attention if irritation persists. Wash contaminated clothing before reuse. Thoroughly clean or destroy contaminated shoes.

SECTION 5. FIRE FIGHTING MEASURES**Suitable Extinguishing Media**

Agents approved for Class B hazards:

- Dry chemical
- Carbon dioxide
- Halogenated agents
- Foam
- Steam
- Water fog

Fire Fighting Equipment

As in any fire, prevent human exposure to fire, smoke, fumes or products of combustion. Evacuate non-essential personnel from the fire area. Firefighters should wear full-face, self contained breathing apparatus and impervious protective clothing. If possible, move containers from the fire area. If not leaking, keep fire exposed containers cool with a water fog or spray to prevent rupture due to excessive heat. High pressure water may spread product from broken containers increasing contamination or fire hazard. Dike fire control water for later disposal. Do NOT allow contaminated water to enter waterways.

Unusual Fire and Explosion Hazards

This product is not defined as flammable or combustible. It is self-extinguishing once the source of ignition is removed. The material is not sensitive to static discharge or physical impact. It may decompose under fire conditions.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

Personnel-related safety precautions: Isolate spill area and restrict nonessential personnel. All personnel involved in spill cleanup should follow appropriate industrial hygiene practices. Particular danger of slipping on leaked/spilled product.

Measures for environmental protection: Stop source of spill if possible. Dike area to prevent spill from spreading.

Measures for cleaning/collecting: Soak up liquid with a suitable absorbent such as clay, sawdust, or kitty litter. Sweep up absorbed material and place in a chemical waste container for disposal. Cover spill area with a slurry of powdered household detergent and water. Use stiff brush to work slurry into cracks and crevices. Allow to stand for 2-3 minutes, then flush with water. Dike water for later disposal. Do NOT allow contaminated water to enter waterways or sewers.

SECTION 7. HANDLING AND STORAGE**Handling**

Empty containers may retain product residues. Follow all warnings and precautions even after container is empty. Containers should be located in an area where they can be rotated regularly (first in, first out) and visually inspected for dents and bulging on a weekly basis.

Wear protective clothing including chemical goggles and rubber gloves when handling this product to avoid eye and skin contact. Handle in well ventilated areas. Avoid inhalation of vapor or mist. Wash thoroughly after handling.

Storage

Store away from foodstuffs and animal feed. Containers should be stored in a cool, dry, well-ventilated area away from flammable or oxidizing materials and sources of heat or flame.

Information about storage in one common storage facility:

Prolonged storage at elevated temperatures under wet alkaline or acidic conditions should be avoided to assure product integrity. Care should be taken to prevent moisture condensation in the container. The product is normally shipped in unlined tank cars, trucks and drums.

Further information about storage conditions:

The maximum storage temperature is 149 F or 65 C (Higher in absence of air/moisture).

At temperatures below 4.4 C (40 F), the viscosity characteristics are such that improved pumping rates may be achieved by warming. Temperatures from 27-37.8 C (80-100 F) provide good flow rates. The product can be stored and transported in equipment constructed of mild steel.

**SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION****Exposure guidelines**

Component	CAS#	Exposure Limits
Triphenyl phosphate	115-86-6	15-25%
PEL 3 mg/m ³ (OSHA)		
TLV 3 mg/m ³ (ACGIH)		
TWA 3 mg/m ³ (NIOSH)		

Eye protection

Safety glasses, chemical goggles, or face shields recommended to prevent contact.

Skin protection

Wear clothing and gloves that cannot be penetrated by chemicals or oil.

Ventilation

Use with adequate ventilation. Avoid breathing vapor. If heated and ventilation is inadequate, use NIOSH certified respirator, which will protect against organic vapor.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Liquid. Clear, Blue.
Odor:	Nearly Odorless.
pH:	Not determined
Boiling point:	Not determined
Pour point :	- 17.77 C
Vapor Pressure:	0.023 mm Hg @ 20 C
Vapor Density:	1.150 @ 15.6 C
Auto ignition temperature:	Not determined.
Solubility in water:	1.5 ug/ml at 20 C
Specific gravity at 15.6°C (60°F):	1.156 at 15.6 C
Viscosity at 38°C:	46.38 cSt

SECTION 10. STABILITY AND REACTIVITY**Conditions to avoid**

Temperature sources which induce thermal decomposition. Prolonged storage at elevated temperatures (above 65.6 C; 150 F) should be avoided.

Dangerous reactions

This product is incompatible with strong oxidizers, strong acids and strong alkalis. It hydrolyzes slowly at ambient temperatures in acidic or alkaline aqueous solutions.

Hazardous polymerization

Will not occur

**SECTION 10. STABILITY AND REACTIVITY continued****Hazardous decomposition**

Vapors may decompose at elevated temperatures to release harmful materials. Under wet acidic or alkaline conditions this product hydrolyzes slowly and nonviolently to form phenol, substituted phenols and aryl phosphoric acids.

Materials to avoid

Avoid contact with strong oxidizing agents.

Stability

Stable

SECTION 11. TOXICOLOGICAL INFORMATION**Acute Toxicity****Dermal LD50:**

>2000 mg/kg (rabbit). Practically non toxic

Oral LD50:

>5000 mg/kg (rat). Practically non toxic.

Inhalation LD50/4h:

>3.1 mg/l (rat) No effect observed at highest attainable concentration.

Primary Irritant Effect:

On the skin: This material was found to be a mild irritant in rabbits following a 24 hour exposure.

On the eye: This product was a mild irritant when tested on rabbits.

Sensitization: No sensitizing effects known.

Sub chronic to chronic toxicity: Daily ingestion by rats of 100, 400, or 1600 ppm of this material in the diet for 3 months produced increases in the liver and adrenal gland weights in females and increases of the liver weights in males at high-dose level. Since not histopathological changes were seen in the organs, the organ weight increases were considered adaptive responses and not a sign of target organ toxicity.

Mutagenicity: This product was examined for mutagenic and clastogenic activity in a series of in vitro assays. The assays included: Ames tests, the mouse lymphoma and chromosome aberration tests. No evidence of genotoxic or mutagenic activity was noted in any of these assays.

Carcinogenicity: This product was tested in a vitro malignant transformation assay using BALB/3T3 cells. It did not induce morphological transformations and thus did not exhibit carcinogenic potential in this assay.

Neurotoxicity: When this material was administered orally to hens at a cumulative oral dose of 23 g/kg, no signs of acute delayed neurotoxicity were noted.

Reproductive effects: IN a developmental toxicity test, daily administration of this material at 100, 400 or 1000 mg/kg to rats on days 6 through 20 of gestation demonstrated maternal toxicity (increased liver weights and reduced food consumption at the high dose) but no indications of teratogenicity were observed. In a rat reproduction study, male and female animals received either 50, 250 or 1000 mg/kg/day for several weeks after which they mated. There was no reproductive toxicity observed at any dose level. Diagnostic pathology confirmed no alterations to the reproductive organs. There was no effect on mating index, litter size, survival of the offspring or on any other measure parameter. This product did not demonstrate reproductive toxicity.



SECTION 15. REGULATORY INFORMATION

Sections 355 (extremely hazardous substances)

Component	CAS #	Exposure Limits
Phenol	108-95-2	.05%

Section 313 (Specific toxic chemical listings):

This product does not contain a toxic chemical subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372 (annual Toxic Chemical Release Reporting).

SARA Title III: Section 304- CERCLA:

This product does not contain a hazardous substance regulated under section 304 for emergency release notification (CERCLA List).

TSCA (Toxic Substances Control Act): Substance is listed.

TSCA Section 12 (b)- Export Notification: This product does not contain any chemicals subject to Section 12(b) export notification.

Proposition 65

Chemicals known to cause cancer: NONE

Chemicals known to cause reproductive toxicity for females: NONE

Chemicals known to cause reproductive toxicity for males: NONE

Chemicals known to cause developmental toxicity: NONE

OSHA status:

This product is considered to be a hazardous chemical under the OSHA Hazard Communication Standard (29 CER 1910.1200)

Resource Conservation and Recover Act (RCRA):

This product is not considered to be a hazardous waste under RCRD (40 CFR 261).

Canadian WHMIS Classification(s): Not controlled

State Regulations:

State Right-to-Know:

Component	CAS #	Exposure Limits
t-Butylphenyl diphenyl phosphate	56803-37-3	30-35%
Bis(t-butylphenyl) phenyl phosphate	65652-41-7	30-35%
Tri(t-butylphenyl) phosphate	78-33-1	10-15%
Triphenyl phosphate	115-86-6	15-25%

**SECTION 16. OTHER INFORMATION**

Product use: Fire Resistant Hydraulic Fluid

This product, to the best of our knowledge, does not contain and is not manufactured with any Class I or II Ozone Depleting Chemicals. (ODCs).

This product does not contain chemicals listed by the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) as causing cancer or reproductive toxicity.

Legend

CAS	Chemical Abstract Service Number
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
OSHA	Occupational Safety and Health Administration
STP	Standard temperature and pressure

The information herein is given in good faith, but no warranty, expressed or implied, is made. Consult **Radco Industries, Inc.** for further information.

THIS INFORMATION RELATES TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. SUCH INFORMATION STATED IS TO THE BEST OF RADCO'S KNOWLEDGE AND BELIEF, ACCURATE AND RELIABLE AS OF THE DATE COMPILED. HOWEVER, NO REPRESENTATION, WARRANTY OR GUARANTEE IS MADE TO ITS ACCURACY, RELIABILITY, OR COMPLETENESS, AND RADCO DOES NOT ACCEPT LIABILITY FOR ANY LOSS OR DAMAGE THAT MAY OCCUR FROM THE USE OF THIS INFORMATION. FINAL DETERMINATION OF SUITABILITY OF ANY MATERIAL IS THE SOLE RESPONSIBILITY OF THE USER. ALL MATERIAL SHOULD BE USED WITH CAUTION TO GUARD AGAINST UNKNOWN HAZARDS. ALTHOUGH CERTAIN HAZARDS ARE DESCRIBED HEREIN, RADCO DOES NOT GUARANTEE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

® Indicates a trademark of **Radco Industries, Inc.**