



RADCOLUBE® FR457 HYDRAULIC FLUID SAFETY DATA SHEET
MIL-H-19457D(SH) HYDRAULIC FLUID, FIRE-RESISTANT, NON-NEUROTOXIC

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: RADCOLUBE® FR457 HYDRAULIC FLUID

This product meets Military Specification MIL-H-19457D(SH) HYDRAULIC FLUID, FIRE-RESISTANT, NON-NEUROTOXIC.

ISO 9001:2015 Certification Number: C2018-00035

Recommended Use

This product meets the requirements of a fire-resistant hydraulic fluid for hydraulic systems which are accumulator loaded and operate above 600 pounds per square inch gauge.

National Stock Numbers (NSN):

9150-01-113-2045 Gallon
9150-01-113-2046 5 Gallon Pail
9150-01-113-2047 55 Gallon Drum

Company Identification

Headquarters and Manufacturing Facility (CAGE Code 6ZS16)
Radco Industries, Inc.
700 Kingsland Drive
Batavia, IL 60510

Customer information number: 1-630-232-7966

EMERGENCY TELEPHONE NUMBER

Advisory Office in case of poisoning: **Chemtrec**
Chemtrec (North America): 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification of mixture:

Acute Aquatic Toxicity, Category 1
Chronic Aquatic Toxicity, Category 1

Hazard Pictograms:



Signal Word:

Warning

Hazard Statements:

H412 + H413:	Harmful to aquatic life with long lasting effects, and may cause long lasting harmful effects to aquatic life.
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Precautionary Statements:

P202:	Do not handle until all safety precautions have been read and understood.
P273:	Avoid release to the environment.
P281:	Use personal protective equipment as required.
P301 + P331:	IF SWALLOWED: Do NOT induce vomiting
P305 + P351:	IF IN EYES: Rinse cautiously with water for several minutes.
P350:	Gently wash with soap and water.
P362:	Take off contaminated clothing and wash before reuse.
P405:	Store locked up.
P501:	Dispose of contents/container to an approved waste disposal plant.

3. COMPOSITION/INFORMATION ON INGREDIENTS



<u>Components</u>	<u>%Content</u>	<u>CAS Number</u>
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

4. FIRST-AID MEASURES

Eyes

Immediately flush eyes with plenty of water for at least 15 minutes.

Ingestion

If swallowed, do NOT induce vomiting. Get medical attention immediately.

Inhalation

Move to fresh air. If unconscious place in recovery position and seek medical advice. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. Remove from further exposure. Immediately call a doctor.

Skin

Wash skin thoroughly with mild soap and plenty of water for at least 15 minutes.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

For small fires use carbon dioxide, dry chemical or foam.

For large fires use alcohol-type foam, universal type foam or water fog.

Fire-Fighting Equipment

Firefighter should wear normal protective equipment (full bunker gear) and positive-pressure contained breathing apparatus. Water can be used to cool fire-exposed containers, to protect personnel and to disperse vapors and spills. Water runoff can cause environmental damage. Dike and collect water used to fight fires.

Special Fire-Fighting Procedures

Use water spray to cool fire-exposed containers and structures. If a rail or tank truck is involved in a fire, isolate for 800 meters (0.5 mile) in all directions. Shut off fuel to fire if it is possible to do so without hazard. If this is impossible, withdraw from the area and let the fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

6. ACCIDENTAL RELEASE MEASURES

Wear protective clothing when taking up spill. Eliminate sources of ignition. This product is insoluble in water and will float on the surface. Prevent from entering sewers or drains. Should this product enter sewers or drains, it should be pumped out into an open vessel.

7. HANDLING AND STORAGE

Handling

Do not breathe vapors/dust. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.

Storage

Do not store in open or unlabeled containers. Keep container tightly closed in a dry and well-ventilated place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<u>Components</u>	<u>CAS Number</u>	<u>TLV (ACGIH)</u>	<u>IDLH (NIOSH)</u>	<u>PEL (OSHA)</u>
t-Butylphenyl diphenyl phosphate	56803-37-3	None established	None established	None established
Bis(t-butylphenyl)phenyl phosphate	65652-41-7	None established	None established	None established
Tri(t-butylphenyl) phosphate	78-33-1	None established	None established	None established
Triphenyl phosphate	115-86-6	3 mg/m ³	1,000 mg/m ³	3 mg/m ³

**Respiratory Protection**

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

Hand Protection

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

Eye Protection

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

Other Protection

Do not eat, drink, or smoke when handling this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Blue, transparent liquid
Odor:	Slight
Odor threshold:	Not Determined
Auto-ignition temperature:	554°C (1,030°F)
Decomposition temperature:	Not Determined
Evaporation Rate (ASTM D972):	0.05% weight at 100°C (212°F)
Flash point Cleveland Open Cup (ASTM D92):	Not Determined
Flash point Pinsky-Martens (ASTM D93):	246°C (475°F)
Flammability (solid, gas):	Non-flammable
Lower flammability limit:	Not Determined
Upper flammability limit:	Not Determined
Initial boiling point and boiling range:	247°C (477°F)
Melting point/freezing point:	Not Determined
Partition coefficient (n-octanol/water), Log P _{ow} :	Not Determined
pH:	Not applicable
Solubility in water:	1.5 µg/mL at 20°C (68°F)
Relative density (ASTM D1298) 15.6°C/15.6°C:	1.156
Vapor density:	Not Determined
Vapor pressure:	0.23 mmHg at 20°C (68°F)
Viscosity (ASTM D445):	4.9 mm ² /s at 100°C (212°F) 44 mm ² /s at 40°C (104°F)

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

Moisture

Materials to avoid

Avoid contact with acids, alkalis and plastic.

Hazardous polymerization

Does not occur.

Hazardous decomposition products

Decomposition of this product under fire conditions can produce carbon dioxide, carbon monoxide, phenol, phosphoric acid, phosphorus oxides, and other organic decomposition products.

Stability

Stable

11. TOXICOLOGICAL INFORMATION



Acute toxicity	Method	Species	Result
Di-tert-butylphenyl phenyl phosphate	--	--	No data available
Tert-butylphenyl diphenyl phosphate	--	--	No data available
Tris(p-tert-butylphenyl) phosphate	--	--	No data available
Triphenyl phosphate	Dermal Inhalation Oral	Rat Mouse Rat	LD ₅₀ > 10,000 mg/kg NOEC = 757 mg/m ³ after 4 hours LD ₅₀ > 20,000 mg/kg

Aspiration hazard	Test Method	Species	Result
Di-tert-butylphenyl phenyl phosphate	--	--	No data available
Tert-butylphenyl diphenyl phosphate	--	--	No data available
Tris(p-tert-butylphenyl) phosphate	--	--	No data available
Triphenyl phosphate	OECD 403	Mouse	Practically non-toxic

Carcinogenicity	Test Method	Species	Result
Di-tert-butylphenyl phenyl phosphate	--	--	No data available
Tert-butylphenyl diphenyl phosphate	--	--	No data available
Tris(p-tert-butylphenyl) phosphate	--	--	No data available
Triphenyl phosphate	Read across	Mouse	Non-carcinogenic

Eye damage / irritation	Test Method	Species	Results
Di-tert-butylphenyl phenyl phosphate	--	--	No data available
Tert-butylphenyl diphenyl phosphate	--	--	No data available
Tris(p-tert-butylphenyl) phosphate	--	--	No data available
Triphenyl phosphate	OECD 405	Rabbit	Not irritating

Germ cell mutagenicity	Test Method	Species	Results
Di-tert-butylphenyl phenyl phosphate	--	--	No data available
Tert-butylphenyl diphenyl phosphate	Ames Test	Salmonella	Non-mutagenic
Tris(p-tert-butylphenyl) phosphate	--	--	No data available
Triphenyl phosphate	OECD 471	<i>S. typhimurium</i>	Non-mutagenic

Reproductive toxicity	Test Method	Species	Results
Di-tert-butylphenyl phenyl phosphate	--	--	No data available
Tert-butylphenyl diphenyl phosphate	--	--	No data available
Tris(p-tert-butylphenyl) phosphate	--	--	No data available
Triphenyl phosphate	OECD 414 OECD 415	Rat Rat	NOAEL ≥ 690 mg/kg bodyweight/day NOEL = 690 mg/kg bodyweight

Respiratory sensitization

No data available

Skin sensitization	Test Method	Species	Results
Di-tert-butylphenyl phenyl phosphate	--	--	No data available
Tert-butylphenyl diphenyl phosphate	--	--	No data available
Tris(p-tert-butylphenyl) phosphate	--	--	No data available
Triphenyl phosphate	OECD 406	Guinea pig	Not sensitizing

Skin corrosion/irritation	Test Method	Species	Results
Di-tert-butylphenyl phenyl phosphate	--	--	No data available
Tert-butylphenyl diphenyl phosphate	--	--	No data available
Tris(p-tert-butylphenyl) phosphate	--	--	No data available
Triphenyl phosphate	OECD 404	Rabbit	Not irritating



Specific target organ toxicity – repeated exposure (STOT-RE)	Route	Species	Results
Di-tert-butylphenyl phenyl phosphate	--	--	No data available
Tert-butylphenyl diphenyl phosphate	--	--	No data available
Tris(p-tert-butylphenyl) phosphate	--	--	No data available
Triphenyl phosphate	Dermal	Rabbit	NOAEL = 1000 mg/kg bodyweight/day
	Oral	Rat	NOAEL = 7500 ppm; liver weight increase

Specific target organ toxicity – single exposure (STOT-SE)

No data available

12. ECOLOGICAL CONSIDERATIONS

Aquatic Toxicity	Test Method	Species	Results
Di-tert-butylphenyl phenyl phosphate	--	--	No data available
Tert-butylphenyl diphenyl phosphate	--	--	No data available
Tris(p-tert-butylphenyl) phosphate	--	--	No data available
Triphenyl phosphate	EPA 660/3-75-009 EPA 660/3-75-009 OECD 211	<i>A. bahia</i> <i>O. mykiss</i> <i>Daphnia magna</i>	LC ₅₀ = 0.18 – 0.32 mg/L LC ₅₀ = 0.4 mg/L after 96 hours NOEC = 0.254 mg/L after 21 days

Terrestrial Toxicity	Test Method	Species	Results
Di-tert-butylphenyl phenyl phosphate	--	--	No data available
Tert-butylphenyl diphenyl phosphate	--	--	No data available
Tris(p-tert-butylphenyl) phosphate	--	--	No data available
Triphenyl phosphate	Busvine Method	<i>Musca Domestica</i>	NOEC = 4.3 µg/fly
	Busvine Method	<i>Chrysomya Putoria</i>	NOEC = 1.5 µg/fly

Biodegradation	Test Method	Results
Di-tert-butylphenyl phenyl phosphate	--	No data available
Tert-butylphenyl diphenyl phosphate	<i>Read across</i>	Not readily biodegradable
Tris(p-tert-butylphenyl) phosphate	--	No data available
Triphenyl phosphate	OECD 301C	83 – 94% biodegradation after 28 days; readily biodegradable

Bioconcentration Factor (BCF)	Results
Di-tert-butylphenyl phenyl phosphate	No data available
Tert-butylphenyl diphenyl phosphate	528 – 1096
Tris(p-tert-butylphenyl) phosphate	No data available
Triphenyl phosphate	144

Partition Coefficient n-octanol / water (Log K _{ow})	Results
Di-tert-butylphenyl phenyl phosphate	No data available
Tert-butylphenyl diphenyl phosphate	5.12
Tris(p-tert-butylphenyl) phosphate	No data available
Triphenyl phosphate	4.63

Soil Mobility (Log K _{oc})	Results
Di-tert-butylphenyl phenyl phosphate	No data available
Tert-butylphenyl diphenyl phosphate	7400
Tris(p-tert-butylphenyl) phosphate	No data available
Triphenyl phosphate	2596 – 3561

13. DISPOSAL INFORMATION

Disposal must be in accordance with applicable federal, state, or local regulations.

Do not allow product to reach ground water, water course, or sewage systems.



This unused material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets criteria for being toxic, corrosive, ignitable, or reactive according to U.S. EPA definitions (40 CFR Subpart C). This material could also become hazardous waste if it is mixed with or comes into contact with a listed hazardous waste. If it is a hazardous waste, regulations in 40 CFR 262-266, 268, 270, and 279 may apply.

“Empty” containers retain residue (liquid and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition; they may explode and cause injury or death. Do not attempt to clean since residue is difficult to remove and even a trace of remaining material constitutes as explosive hazard. “Empty” drums should be completely drained, properly bunged, and promptly returned to a drum recycler. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

14. TRANSPORT INFORMATION

U.S. Dept. of Transportation Shipping Name

UN Number: UN3082
UN Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (TRIPHENYL PHOSPHATE, TERT-BUTYLATED TRIPHENYL PHOSPHATE MIXTURES CONTAINING 10% TO 48% TRIPHENYL PHOSPHATES)
Transport hazard class: 9
Packing group: III

Not regulated: **49 CFR 171.4c:** (1) Except when all or part of the transportation is by vessel, the requirements of this subchapter specific to marine pollutants do not apply to non-bulk packagings transported by motor vehicle, rail car or aircraft. (2) Single or combination packagings containing a net quantity per single or inner packaging of 5 L or less for liquids or having a net mass of 5 kg or less for solids, are not subject to any other requirements of this subchapter provided the packagings meet the general requirements in 173.24 and 173.24a.

Canadian Transportation of Dangerous Goods Shipping Name (TDG)

UN Number: UN3082
UN Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (TRIPHENYL PHOSPHATE, TERT-BUTYLATED TRIPHENYL PHOSPHATE MIXTURES CONTAINING 10% TO 48% TRIPHENYL PHOSPHATES)
Transport hazard class: 9
Packing group: III

Not regulated (450-liter or less inner packaging): **Special Provision 99 (2):** These Regulations, except for Part 1 (Coming into Force, Repeal, Interpretation, General Provisions and Special Cases) and Part 2 (Classification), do not apply to the handling, offering for transport or transporting of less than 450 kg of UN3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., or less than 450 L of UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., on a road vehicle or a railway vehicle. The dangerous goods must be contained in one or more small means of containment designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no accidental release of the dangerous goods that could endanger public safety.

International Air Transport Association (IATA)

Not regulated (5-liter or less inner packaging): **Special Provision A197:** These substances when transported in single or combination packagings containing net quantity per single or inner packaging of less than 5 L or less for liquids or having a net mass of 5 kg or less for solids, are not subject to any other provisions of these Regulations provided the packagings meet the general provisions 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.

International Carriage of Dangerous Goods by Inland Waterways (ADN)

UN Number: UN3082
UN Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (TRIPHENYL PHOSPHATE, TERT-BUTYLATED TRIPHENYL PHOSPHATE MIXTURES CONTAINING 10% TO 48% TRIPHENYL PHOSPHATES)
Transport hazard class: 9
Packing group: III
MARPOL73/78 and IBC Code: P



Radco Industries, Inc. 700 Kingsland Drive, Batavia, Illinois 60510, United States

Product Name: RADCOLUBE® FR457

MIL-H-19457D(SH) HYDRAULIC FLUID, FIRE-RESISTANT, NON-NEUROTOXIC

Emergency schedules (EmS): F-A, S-F
Special provisions: 274; 335; 375; 601

Not regulated (5-liter or less inner packaging): **Special Provision 375:** These substances when carried in single or combination packagings containing a net quantity per single or inner packaging of 5 l or less for liquids or 5 kg or less for solids, are not subject to any other provision of ADN provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8 of ADR.

International Carriage of Dangerous Goods by Rail (RID)

UN Number: UN3082
UN Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (TRIPHENYL PHOSPHATE, TERT-BUTYLATED TRIPHENYL PHOSPHATE MIXTURES CONTAINING 10% TO 48% TRIPHENYL PHOSPHATES)
Transport hazard class: 9
Packing group: III
Special provisions: 274; 335; 375; 601

Not regulated (5-liter or less inner packaging): **Special Provision 375:** These substances when carried in single or combination packagings containing a net quantity per single or inner packaging or 5 l or less for liquids having a net mass per single or inner packaging of 5 kg or less for solids, are not subject to any other provisions of the RID provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.

International Carriage of Dangerous Goods by Road (ADR)

UN Number: UN3082
UN Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (TRIPHENYL PHOSPHATE, TERT-BUTYLATED TRIPHENYL PHOSPHATE MIXTURES CONTAINING 10% TO 48% TRIPHENYL PHOSPHATES)
Transport hazard class: 9
Packing group: III
Special provisions: 274; 335; 375; 601

Not regulated (5-liter or less inner packaging): **Special Provision 375:** These substances when carried in single or combination packagings containing a net quantity per single or inner packaging of 5 l or less for liquids or having a net mass per single or inner packaging of 5 kg or less for solids, are not subject to any other provisions of ADR provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.

International Civil Aviation Organization (ICAO)

Not regulated (5-liter or less inner packaging): **Special Provision A197:** These substances when transported in single or combination packagings containing net quantity per single or inner packaging of less than 5 L or less for liquids or having a net mass of 5 kg or less for solids, are not subject to any other provisions of these Regulations provided the packagings meet the general provisions 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.



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Product Name: RADCOLUBE® FR457

MIL-H-19457D(SH) HYDRAULIC FLUID, FIRE-RESISTANT, NON-NEUROTOXIC

International Maritime Dangerous Goods Code (IMDG Code)

UN Number: UN3082
UN Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (TRIPHENYL PHOSPHATE, TERT-BUTYLATED TRIPHENYL PHOSPHATE MIXTURES CONTAINING 10% TO 48% TRIPHENYL PHOSPHATES)
Transport hazard class: 9
Packing group: III
MARPOL73/78 and IBC Code: P
Emergency schedules (EmS): F-A, S-F
Special provisions: 274; 335; 969

Not regulated (5-liter or less inner packaging): **2.10.2.7:** Marine pollutants packaged in single or combination packagings containing a net quantity per single or inner packaging of 5 L or less for liquids or having a net mass per single or inner packaging of 5 kg or less for solids are not subject to any other provision of this Code relevant to marine pollutants provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8. In the case of marine pollutants also meeting the criteria for inclusion in another hazard class, all provisions of this Code relevant to any additional hazards continue to apply.

15. REGULATORY INFORMATION

California (Proposition 65)

This product does not contain any of the substances known to the State of California to cause cancer, birth defects, or reproductive harm.

CERCLA Reportable Quantity

This product is not reportable under 40 CFR Part 302.4.

Environmental Protection Agency

None of the ingredients are listed

National Toxicology Program (NTP)

None of the ingredients are listed.

OSHA Hazard Communication Standard

Not hazardous per 29 CFR 1910.1200(d).

SARA Title III Section 302 Extremely Hazardous Substances (40 CFR Part 355)

This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA Title III Sections 311/312 Hazardous Categorization (40 CFR Part 370)

Hazardous categories for this product are:

Acute = No Chronic = No Fire = No Pressure = No Reactive = No

SARA Title III Section 313 (40 CFR Part 372)

This product is not regulated under Section 313 of SARA and 40 CFR Part 372.

U.S. Inventory (TSCA)

Listed on inventory.

Australia Inventory (AICS)

Listed on inventory.

Canada Inventory (DSL)

All of the ingredients are listed.

China (CICS)

None of the ingredients are listed.

EC Inventory (EINECS/ELINCS)

In Compliance



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International Agency for Research on Cancer (IARC)

None of the ingredients are listed.

Japan Inventory (MITI)

Listed on inventory.

Korea Inventory (ECL)

Listed on inventory.

16. OTHER INFORMATION

Safety Data Sheet Creation Date: 2 January 2012

Safety Data Sheet Revision Date: 14 January 2019

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 PARTICULAR PROCESS OR FOR ANY PARTICULAR PURPOSE. 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, PURCHASERS, USERS AND DISTRIBUTORS ARE NOT RELYING ON ANY PROMISE, REPRESENTATION, OR RECOMMENDATION MADE BY RADCO, 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.

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