

ARISTECH

MATERIAL SAFETY DATA SHEET

MSDS Number: C1007K

Issue Date: 10/17/85

Product Name: Di(2-ethylhexyl) phthalate

Revised Date: 11/02/98

ARISTECH CHEMICAL CORPORATION
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Emergency:
(412) 433-7654 (8 a.m.-5 p.m. Mon.-Fri.)
(412) 571-5888 (Off-Hour Emergencies)

SECTION I - PRODUCT IDENTIFICATION

Product Name: Di(2-ethylhexyl) phthalate
Synonyms: PX-138; DOP; DEHP; Dioctyl phthalate
Chemical Name: bis(2-ethylhexyl)ester, 1,2-benzenedicarboxylic acid
Division: Chemicals

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT NAME	CAS No.	% WT	EXPOSURE LIMITS
Di (2-ethylhexyl) phthalate (DEHP)	117817	100	Y (Hazardous) 5 mg/m ³ (OSHA PEL TWA) 10 mg/m ³ (OSHA PEL STEL) 5 mg/m ³ (ACGIH TLV TWA) 10 mg/m ³ (ACGIH TLV STEL)

SECTION III - HAZARD IDENTIFICATION

Emergency Overview: CAUTION! Generally recognized as a low potential industrial hazard. May cause mild eye irritation. Possible cancer hazard. May cause cancer based on animal data. Risk of cancer depends on duration and level of exposure.

Relevant Routes of Exposure: Eye and skin contact.

Signs and Symptoms of Acute Overexposure: Due to its low vapor pressure, the inhalation exposure hazard potential is regarded to be low. However, if the product is heated, misted or sprayed, it may become irritating to the mucous membranes of the upper respiratory tract. Symptoms may include runny nose, coughing and sneezing. Based on skin irritation studies, contact with product is not expected to cause skin irritation. Eye contact with the liquid and mists may produce mild irritation. Symptoms may include tearing, redness, burning and swelling of eye tissue. If product is ingested, it is not expected to be toxic. However, if swallowed, product may cause nausea, vomiting and diarrhea.

Signs and Symptoms of Chronic Overexposure: May cause cancer based on animal data, risk of cancer depends on duration and level of exposure. The relevance to potential human cancer formations is unclear. The carcinogenic potential of peroxisome proliferating substances has been investigated in primates and humans and suggests that DEHP does not pose a cancer hazard to humans.

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Medical Conditions Generally Aggravated By Exposure: Individuals with chronic respiratory disorders may be adversely affected by any fume or airborne particulate matter exposure. Persons with preexisting skin disorders may be more susceptible to the effects of this material.

Potential Health Effects:

Eyes:	May cause mild eye irritation.
Skin:	No irritation expected.
Ingestion:	If swallowed, may cause nausea, vomiting and diarrhea.
Inhalation:	Excessive inhalation of misted or sprayed product may cause irritation of the upper respiratory tract.

Carcinogenicity:

NTP:	Y
IARC:	Y
OSHA:	N/A
ACGIH:	Y
OTHER:	N/A

Additional Information If Applicable

DEHP is considered an IARC 2B carcinogen: Possible human carcinogen, human evidence inadequate, animal evidence sufficient.

It is also considered an NTP reasonably anticipated carcinogen- limited evidence in humans and/or sufficient evidence in animals.

ACGIH considers DEHP an A3- Animal Carcinogen: The agent is carcinogenic in experimental animals at relatively high doses, by routes of administration at sites of histologic types, or by mechanisms that are not considered relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence suggests that the agent is not likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.

For additional toxicity data regarding carcinogenicity studies, please see Section XI, Toxicological Information.

SECTION IV - FIRST AID MEASURES

Eyes:	Flush with large amounts of water for at least 15 minutes. Call a physician immediately.
Skin:	Remove contaminated clothing. Wash skin thoroughly with soap and plenty of water. If irritation develops, call a physician.
Ingestion:	If conscious, give 1 to 2 glasses of milk or water and induce vomiting by touching index finger to the back of throat. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Call a physician immediately.

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Inhalation: Remove from exposure. If breathing is difficult, administer artificial respiration (mouth-to-mouth) or oxygen as indicated. Call a physician immediately.

Notes to Physicians: None.

SECTION V - FIRE FIGHTING PROCEDURES

Flammable Limits in Air (% by Volume): Uel: N/A Flash Point: 420 Deg. F (COC)
 Lel: 0.3% @ 474 Deg. F

Extinguishing Media: Use water fog, foam, carbon dioxide, or dry chemicals to extinguish fire.

Fire Fighting Instructions: Firefighters should wear self-contained breathing apparatus and full protective clothing when fighting fires. Use cold water spray to cool fire-exposed containers.

Unusual Fire and Explosion Hazards: The use of water to extinguish fire may cause frothing.

Known or Anticipated Hazardous Products of Combustion: Carbon monoxide, carbon dioxide and organic acids.

SECTION VI - ACCIDENTAL RELEASE MEASURES

Accidental Release Measures and Methods for Cleanup: Avoid excessive breathing of fumes. Dike spill to prevent entry into sewers and waterways. Absorb spill with sand, vermiculite or other non-biodegradable sorbent. Clean up spill and place in labeled containers for disposal. If necessary, clean up personnel should wear recommended protective equipment. DEHP is on the CERCLA list of hazardous substances and spills of reportable quantities must be reported to the National Response Center (800-424-8802). The CERCLA reportable quantity (RQ) for DEHP is 100 lb.

SECTION VII - HANDLING AND STORAGE

Handling: Read material safety data sheet before handling any chemical material.

Storage: No special handling precautions.

SECTION VIII - EXPOSURE CONTROLS/ PERSONAL PROTECTION

Ventilation Requirements: Local exhaust ventilation should be used to control the emissions of air contaminants. General dilution ventilation may assist with the reduction of air contaminant concentrations.

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Personal Protective Equipment:

Eye/Face: Wear chemical safety glasses, goggles or face shield to prevent contact with eyes.

Skin: Wear protective clothing and gloves to prevent contact with skin. Natural rubber, neoprene, polyvinyl chloride and nitrile protective garments have been suggested for protection against materials of this chemical class.

Respiratory: Respiratory equipment approved by NIOSH/MSHA for protection against organic vapors should be used to avoid inhalation of excessive air contaminants. The appropriate respirator selection depends on the type and magnitude of the exposure (refer to 29 CFR 1910.134 for appropriate NIOSH approved respirators and the NIOSH Pocket Guide to Chemical Hazards, DHHS (NIOSH) Publication No. 94-116 for equipment selection).

Other Protective Clothing/Equipment: Emergency eye wash stations and safety showers should be available in the work area.

Additional Information If Applicable

SECTION IX - PHYSICAL/ CHEMICAL PROPERTIES

Appearance:	Clear liquid.		
Boiling Point:	446 Deg. F @ 1mm Hg	Molecular/Chemical Formula:	$C_{26}H_{44}(COOC_8H_{17})_2$
Evaporation Rate:	<0.005	Bulk Density:	N/A
Freezing Point:	N/A	Melting Point:	-55 Deg. C
Octanol/Water Partition Coefficient:	N/A	Water/Oil Distribution Coefficient:	N/A
Odor:	Mild odor.	Odor Threshold:	N/A
Percent Volatile:	Negligible	pH Value:	N/A
Physical State:	Liquid	Reactivity in Water:	N/A
Solubility in Water:	Negligible	Specific Gravity or Density (Water=1):	0.983 @ 25 deg.C
Vapor Density:	13.5 (air=1)	Vapor Pressure:	<1.2 mmHg @ 200 Deg. C

Additional Information If Applicable



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SECTION X - STABILITY / REACTIVITY

Stability:	Stable.
Conditions to Avoid:	None known.
Incompatibility With Other Materials:	Nitrates, strong oxidizers, strong acids and strong alkalies.
Hazardous Decomposition Products:	Possibly carbon monoxide, carbon dioxide and organic acids.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	None known.

SECTION XI - TOXICOLOGICAL INFORMATION

VALUE	ANIMAL	ROUTES	COMPONENTS
25000 mg/kg	Rabbit	Dermal- LD50	Di(2-ethylhexyl) phthalate
30600 mg/kg	Rat	Oral- LD50	Di(2-ethylhexyl) phthalate

Toxicological Information:

Toxicity Summary of Di(2-ethylhexyl) phthalate (DEHP):

Di(2-ethylhexyl)phthalate exhibits a very low order of acute mammalian toxicity following any route of exposure. Early studies in mice, rats and rabbits of several strains resulted in little sign of acute toxicity other than death at unrealistically high doses, often in excess of 30,000 mg/kg orally. Inhalation studies of mixed vapor and aerosol resulted in mortality (rat) only when the test atmosphere reached a DEHP concentration of 4000 mg/m³ or greater. DEHP is not a dermal irritant or dermal sensitizer.

Results of repeated oral dosing of DEHP are species dependent. Repeated treatment with doses greater than 100 mg/kg/day produce marked liver cell peroxisome proliferation in rats and mice. This response occurs also in hamsters but to a much lesser degree. Non-rodent species such as dogs and monkeys do not exhibit peroxisome proliferation following DEHP dosing. Liver peroxisome proliferation, liver enlargement and liver cellularity changes, in even the most sensitive rodent species, are reversible following cessation of DEHP dosing. At dietary doses of 12,000 ppm or greater, body weight gain suppression occurs as does testicular degeneration with resulting loss of sperm production. Chronic or lifetime dosing studies with DEHP have resulted in noncarcinogenic toxicity to the liver, kidney and testes of rodents and, in the F344 rat and B6C3F1 mouse, liver cancer. A carcinogenic response has been tested for but not demonstrated in other strains of rats, dogs, hamsters and Guinea pigs. The carcinogenic potential of peroxisome proliferating substances has been investigated in primates and humans and suggests that DEHP does not pose a cancer hazard to humans. Findings at a recent symposium entitled "Do Peroxisome Proliferating Compounds Pose a Hepatocarcinogenic Hazard to Humans?" concluded that it is "unlikely that peroxisome proliferators are carcinogenic to humans under anticipated conditions and levels of exposure, although their carcinogenic potential cannot be ruled out under extreme conditions of exposure" (Cattley et Al., Regulatory Toxicology and Pharmacology 27, 47-60 (1998).



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Oral and inhalation exposure of DEHP to pregnant animals has resulted in adverse fetal growth effects at maternally toxic oral doses. Inhalation testing for developmental toxicity failed to produce signs of fetal or developmental toxicity. Reproductive toxicity studies in rodents have produced evidence of high-dose DEHP-related impairment in reproductive function. Marked species differences characterize the reproductive and developmental toxicity of DEHP; mice appear to be unusually sensitive to DEHP developmental and reproductive effects.

DEHP toxicity appears to be a high-dose phenomenon readily demonstrable in some but not all rodent species and strains. Liver toxicity, so characteristic of rodent responses to DEHP, appears to be irrelevant to humans. The carcinogenic response of DEHP has been demonstrated only in one strain of rat and mouse and does not appear to be a feature of toxicity in higher order mammals, especially primates. Reproductive and developmental toxicity, likewise appears to be limited to high-dose effects seen in rodent testing. The relevance to humans of this testing has not been established.

Because of differences in toxicity responses to DEHP between rodents and nonrodents including primates, the relevance of rodent DEHP toxicology findings to humans is not clear. Rodents are inherently more sensitive than primates to DEHP effects. There is no evidence for human adverse health effects from DEHP exposure. Occupational exposure to DEHP is limited to the dermal and inhalation routes and the magnitude of this exposure is negligible. The EPA has estimated that the average total exposure of the general population to DEHP is about 0.004 mg/kg/day. This allows for a 50 fold safety factor between the estimated daily exposure and the EPA calculated chronic reference dose for human exposure to DEHP, 0.02 mg/kg/day.

Additional Information If Applicable

SECTION XII - ECOLOGICAL INFORMATION

Ecological Information:

Environmental Fate:

Aquatic: DEHP released to water systems will biodegrade fairly rapidly (half-life 2-3 weeks) following a period of acclimation. It will also strongly adsorb to sediments (log K_{oc} 4 to 5). Phthalate esters are degraded by microbiota and metabolized by fish and animals; they are not expected to biomagnify.

Atmospheric: DEHP released to air can be carried for long distances in the troposphere. Washout by rain appears to be a significant removal process. It is unknown whether direct photolysis or photooxidation are important atmospheric processes.

Terrestrial: DEHP released to soil will neither evaporate nor leach into groundwater. Limited data are available to suggest that it may biodegrade in soil under aerobic conditions following acclimation.

EC or LC50 DEHP:

>0.16 mg/L mortality, 48hr static, *Daphnia magna*
 >19.5 mg/L mortality, 96hr flow-thru, *O. mykiss* (rainbow trout)
 >100 mg/L mortality, 96hr, static, *O. mykiss*

EC data from Aquatic Toxicity of Eighteen Phthalate Esters Article published in Environ. Toxicology and Chemistry, Vol. No.5 pp. 875-91, 1997.

Additional Information If Applicable

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SECTION XIII - DISPOSAL CONSIDERATIONS

Disposal Considerations: Dispose of in accordance with local, state and federal requirements.
DEHP is specifically listed as an EPA RCRA U028 hazardous waste.

Additional Information If Applicable

SECTION XIV - TRANSPORT INFORMATION

U.S. DOT

Proper Shipping Name: Environmentally Hazardous Substance, Liquid, n.o.s.
(bis(2-ethylhexyl) phthalate)* **Hazard Class:** 9

ID Number: UN3082 **Packing Group:** III

Additional Information If Applicable

* See Section VI, for Reportable Quantity (RQ) information.

*Not regulated when shipped in 5 gallon or smaller containers.

SECTION XV - REGULATORY INFORMATION

U.S. Federal Regulations: Toxic Substances Control Act (TSCA) Inventory- Yes
TSCA (Section 12(b)) One-Time Export Notification Substance- Yes
Superfund Amendment and Reauthorization Act (SARA 313)- Yes
Clean Air Act (Section 112) Statutory Air Pollutants- Yes
SARA (Section 110) Priority List of CERCLA Hazardous Substances- Yes

State Regulations: Pennsylvania Hazardous Substance List- DEHP(E,S)
New Jersey Hazardous Substance List- DEHP(S)
Massachusetts Substance List- DEHP (C,E)
California Proposition 65- DEHP*
*Warning, this product contains chemical(s) known to the state of California to cause cancer and/or births defects or other reproductive harm. DEHP is specifically listed on the Proposition 65 List. California has established a No Significant Risk Level (NSRL) for DEHP of 80 micrograms per day. Each chemical product should be assessed in light of its own use.

International Regulations: Canadian Inventory (DSL)- Yes
European Inventory (EINECS)- Yes
Australian Chemical Substances(AICS)- Yes
Japan (ENCS)- Yes
Korea (ECL)- Yes

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SARA Hazards:

Acute:	Yes	Chronic:	Yes
Reactive:	No	Fire:	No
Pressure:	No		

Additional Information If Applicable

SECTION XVI - OTHER INFORMATION

NFPA Codes:

Health:	1	Flammability:	1
Reactivity:	0		

HMIS Codes:

Health:	1	Flammability:	1
Reactivity:	0		

Label Statements:

CAUTION! Generally recognized as a low potential industrial hazard. May cause mild eye irritation. Possible cancer hazard. May cause cancer based on animal data. Risk of cancer depends on duration and level of exposure.

Avoid contact with eyes and skin.

Avoid breathing mists and vapors.

Wash thoroughly after handling.

Use only with adequate ventilation.

Wear chemical safety goggles and faceshield, gloves, and approved respirator for protection against organic vapors and other protective equipment while handling (consult MSDS).

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Other Information:

If you require additional information regarding any legal or regulatory requirements referred to in this MSDS, we suggest that you consult with an appropriate regulatory agency, or with a professional with expertise in this area.

This information is taken from sources or based upon data believed to be reliable; however, Aristech Chemical Corporation makes no warranty as to the absolute correctness or sufficiency of any of the foregoing or that additional or other measures may not be required under particular conditions.

Additional Information If Applicable

Reason for MSDS Revision: Update toxicity information in Section XI.

This MSDS was prepared in accordance with the ANSI Z400.1 1993 Guideline for the Preparation of Material Safety Data Sheets.

KEY

N/A= Not Applicable

MSHA=Mine Safety and Health Administration

NIOSH=National Institute of Occupational Safety and Health

SARA= Superfund Amendment and Reauthorization Act

CNS= Central Nervous System

ACGIH=American Conference of Governmental Industrial Hygienists

OSHA=Occupational Safety and Health Administration

TLV=Threshold Limit Value

PEL=Permissible Exposure Limit

TWA=Time Weighted Average

STEL=Short Term Exposure Limit

CEIL=Ceiling Limit Value

For additional product information call (412) 433-7700.