Arch Chemicals, Inc.

MATERIAL SAFETY DATA

FOR ANY EMERGENCY, CALL 24HOURS/ 7 DAYS:	**1-800-654-6911**
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC(R):	1-800-424-9300
FOR ALL MSDS QUESTIONS & REQUESTS, CALL:	1-800-511-MSDS

PRODUCT NAME: **HPR 504**

1. PRODUCT AND COMPANY IDENTIFICATION

REVISION DATE:	01-16-2005
SUPERCEDES:	01-10-2005
MSDS NO:	00532-0080 - 800093
SYNONYMS:	None
CHEMICAL FAMILY:	Organic mixture
DESCRIPTION / USE:	Positive photoresist
FORMULA:	Not applicable/Mixture

Arch Chemicals, Inc. 501 Merritt 7 PO Box 5204 Norwalk, CT 06856-5204

2. COMPOSITION / INFORMATION ON INGREDIENTS

CAS or CHEMICAL NAME	CAS #	% Range
Ethyl lactate	97-64-3	61 - 90
Novolac resin	Proprietary	10 - 29
Naphthoquinone diazide esters	68510-93-0	1 - 11

3. HAZARDS IDENTIFICATION

OSHA Hazard Classification: combustible liquid, eye irritant, skin irritant, respiratory irritant, central nervous system depressant

Routes of Entry:	Inhalation, skin, eyes, ingestion
Chemical Interactions:	No known interactions
Medical Conditions Aggravated:	None known or reported

Human Threshold Response Data

Odor Threshold:

Ethyl lactate	recognition: 1.42 ppm detection: 0.801 ppm
Irritation Threshold:	Not established

Hazardous Materials Identification System/National Fire Protection Association Classifications

Hazard Ratings:	Health	Flammability	Reactivity
HMIS	1	2	1
NFPA	Not established		

Immediate (Acute) Health Effects

Inhalation Toxicity:	Not expected to be toxic by inhalation. Inhalation of high concentrations may result in central nervous system (CNS) effects such as dizziness, weakness, fatigue, nausea, headache, and lack of coordination.
Inhalation Irritation:	High concentrations may be slightly irritating to the eyes, nose, throat, and lungs.
Skin Contact:	Skin contact may cause irritation consisting of transient redness and swelling. Prolonged skin contact may cause a yellow discoloration if not properly washed off.
Eye Contact	Contact may cause moderate irritation consisting of transient redness, swelling, and mucous membrane discharge to the conjunctiva. No corneal involvement or visual impairment is expected.
Ingestion Irritation:	Ingestion may cause irritation of the gastrointestinal tract and gastrointestinal discomfort with any or all of the following symptoms: nausea, vomiting, lethargy or diarrhea.
Ingestion Toxicity:	Not expected to be toxic by ingestion unless large amounts are swallowed.

Acute Target Organ Toxicity: Skin, Eyes, Central nervous system

Prolonged (Chronic) Health Effects

Carcinogenicity:	This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.
Reproductive and Developmental Toxicity:	Not known or reported to cause reproductive or developmental toxicity.

Inhalation:	There are no known or reported effects from chronic exposure except for effects similar to those experienced from acute exposure.
Skin Contact:	Dermal contact may cause defatting of skin and/or dermatitis.
Ingestion:	There are no known or reported effects from chronic ingestion except for effects similar to those experienced from single exposure.

Chronic Target Organ Toxicity:	Skin
Supplemental Health Hazard Information:	No additional health information available.

4. FIRST AID MEASURES

Inhalation:	IF INHALED: Remove individual to fresh air. If respiratory irritation develops, call a physician.
Skin Contact:	IF ON SKIN: Immediately flush skin with plenty of water for 15 minutes. If clothing comes in contact with the product, the clothing should be removed immediately and lanudered before re-use. Seek medical attention.

Eyes:	IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention immediately.
Ingestion:	IF SWALLOWED: Immediately drink water to dilute. Consult a physician if symptoms develop. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flammability Summary (OSHA): Combustible.

Flammable Properties

Flash Point: 55 Deg. C. / 131 Deg. F. (Test Method: Open Cup)
Autoignition Temperature: No data

Upper Flammable/Explosive Limit, % in air: No data
Lower Flammable/Explosive Limit, % in air: No data

Fire/Explosion Hazards:	Vapors may be ignited by sparks, flames or other sources of ignition if material is above the flash point giving rise to a flash fire. Vapors are heavier than air and may travel to a source of ignition and flash back.
Extinguishing Media:	Use alcohol foam, carbon dioxide, dry chemical or water spray when fighting fires.
Fire Fighting Instructions:	In case of fire, use normal fire fighting equipment including a NIOSH approved self-contained breathing apparatus (SCBA). Use water to cool containers.
Hazardous Combustion Products:	Oxides of nitrogen

6. ACCIDENTAL RELEASE MEASURES

Personal Protection for Emergency Situations:	Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to boots, impervious gloves, hard hat, splash-proof goggles, impervious clothing, i.e., chemically impermeable suit, self-contained breathing apparatus.

Spill Mitigation Procedures

Air Release:	Hazardous concentrations in air may be found in local spill area and immediately downwind. Vapors may be suppressed by the use of water fog. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.
Water Release:	This material is heavier than and slightly soluble in water. Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste. If unable to divert create an overflow dam to contain material. Continue to handle as described in land spill.
Land Release:	Create a dike or trench to contain materials. Cover with dry lime, sand or soda ash. Absorb spill with inert material (e.g., dry sand, clay, earth or commercial absorbent), then place in a chemical waste container.
Additional Spill Information:	Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel. Utilize emergency response personal protection equipment prior to the start of any response. Evacuate all non-essential personnel. Dispose of spill residues per guidelines under Section 13, Disposal Consideration. This material may be neutralized for disposal; you are requested to contact Arch Chemicals at 1- 800-654-6911 before beginning any such procedure.

7. HANDLING AND STORAGE

Handling:	Do not take internally. Avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing (dust, vapor, mist, gas). Keep container closed when not in use. Use only with adequate ventilation.
Storage:	Store in a cool dry ventilated location, away from sources of ignition or other incompatible conditions and chemicals. Keep container(s) closed. Outside or detached storage is preferred. Store in a tightly closed container. Contents may develop pressure upon prolonged storage. Use caution when opening. Do not allow out-of-date product to accumulate. Do not expose to direct light. Dry residue may be shock sensitive.
Shelf Life Limitations:	See label or certificate of analysis for shelf life if applicable.
Incompatible Materials for Storage:	Refer to Section 10, "Incompatible Materials."
Do Not Store At temperatures Above:	10 Deg. C. 50 Deg. F.
Do Not Store At Temperatures Below:	4.5 Deg. C. 40 Deg. F.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation:	Local exhaust ventilation or other engineering controls are normally required when handling or using this product.

Protective Equipment for Routine Use of Product

Respiratory Protection:	Wear a NIOSH approved respirator if any exposure occurs.
Respirator Type(s):	NIOSH approved air purifying respirator with organic vapor cartridge and dust/mist filter. Air purifying respirators should not be used in oxygen deficient or IDLH atmospheres or if exposure concentrations exceed ten (10) times the published limit.
Skin:	Wear impervious gloves to avoid skin contact. Follow good industrial hygiene practices.
Eyes:	Use chemical goggles.
Protective Clothing Type:	Impervious

Exposure Limit Data

CHEMICAL NAME	CAS #	OSHA PEL / STEL	ACGIH LIMITS	AIHA WEEL
No data				

CHEMICAL NAME	NIOSH Immediately Dangerous to Life or Health:
The IDLH has not been established for this product.	

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solution
Color:	yellow red
Odor	mild ester-like
Molecular Weight:	Not Applicable/Mixture
pH	(@ 25 Deg. C) Not applicable
Octanol/Water Coeff:	No data

Solubility in Water:	Slight
Bulk Density:	Not applicable
Specific Gravity:	1.07 - 1.09
Vapor Density:	3.5 - 4.1 (air =1)
Vapor Pressure:	(@ 25 Deg. C) 1.5 - 2 mmHg
Evaporation Rate:	0.2 - 0.29 (n-Butyl acetate = 1)
Boiling Point:	No data
Freezing Point:	No data
Volatiles, % by vol.:	60 - 80 %
VOC Content %w/w / lbs/gal:	75.00 / 6.81
HAP Content %w/w / lbs/gal:	0.00 / 0.00

10. STABILITY AND REACTIVITY

Stability and Reactivity Summary:	Stable under normal conditions. Static discharge may cause ignition at temperatures at or above the flash point. Not sensitive to mechanical shock.
Reactive Properties:	Dry residue may be shock sensitive.
Hazardous Polymerization:	Will not occur
Conditions to Avoid:	High temperatures , Avoid direct exposure to sunlight or ultraviolet (UV) light sources. Sparks, open flame, other ignition sources, and elevated temperatures.
Chemical Incompatibility:	strong oxidizing agents
Hazardous Decomposition Products:	carbon dioxide, carbon monoxide, Formaldehyde, oxides of nitrogen, Cresols

Decomposition Temperature: > 50 Deg. C. > 122 Deg. F.

11. TOXICOLOGICAL INFORMATION

Component Animal Toxicology

Oral LD50 value:

Ethyl lactate — Oral LD50: Rat > 5 g/kg

Dermal LD50 value:

Ethyl lactate — Dermal LD50 Rabbit > 2 g/kg

Inhalation LC50 value: No data

Product Animal Toxicity:

Oral LD50 value:	Rat Believed to be > 5 g/kg
Dermal LD50 value:	Rabbit Believed to be > 2 g/kg
Inhalation LC50 value:	No data
Skin Irritation:	This material is expected to be moderately irritating.
Eye Irritation:	This material is expected to be moderately irritating.

Reproductive and Developmental Toxicity: Not known or reported to cause reproductive or developmental toxicity.

Component Data:

Ethyl lactate: This chemical has been tested in laboratory animals and no evidence of teratogenicity was seen.

Mutagenicity: Not known or reported to be mutagenic.

Component Data:

Ethyl lactate	This chemical did not show mutagenic activity when tested in the Salmonella/Mammalian Microsome Plate Incorporation Mutagenicty Assay.
Naphthoquinone diazide esters	This product has been shown to be non-mutagenic based on a battery of assays.
Carcinogenicity:	This chemical is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA.

12. ECOLOGICAL INFORMATION

Ecological Toxicity Values:
Ethyl lactate 96 hr. LC50: = 100 - 1000 ppm

13. DISPOSAL CONSIDERATIONS

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

Waste Disposal Summary:	Spent or discarded material is a hazardous waste.
Potential US EPA Waste Codes:	D001
Disposal Methods:	As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by incineration.

Components subject to land ban restrictions: Ethyl lactate (D001)

14. TRANSPORT INFORMATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.
DOT Description (49 CFR 172.101):

Land (U.S. DOT):	NOT REGULATED IN NON BULK PACKAGES; BULK: ETHYL LACTATE, COMBUSTIBLE LIQUID , UN1192 PGIII
Air (IATA/ICAO):	ETHYL LACTATE SOLUTION, 3, UN1192, PGIII
Water (IMO):	ETHYL LACTATE SOLUTION, 3.3, UN1192, PGIII
	Flash Point: (C) 55
Hazard Label/Placard:	(Primary) LAND: NONE AIR/WATER: FLAMMABLE LIQUID

Emergency Response Guide Number: 129

15. REGULATORY INFORMATION

UNITED STATES:
Toxic Substances Control Act (TSCA): The components of this product are listed on the TSCA Inventory of Existing Chemical Substances.

Pesticide acceptance indication: US EPA Registration Number: Not applicable

Superfund Amendments and Reauthorization Act (SARA) Title III:

Hazard Categories Sections 311/312 (40 CFR 370.2):

Health:	Acute
Physical:	Fire

Emergency Planning & Community Right to Know (40 CFR 355, App. A):

Extremely Hazardous Substance Section 302 - Threshold Planning Quantity:
Not applicable

Reportable Quantity (40 CFR 302.4):
None listed

Supplier Notification Requirements (40 CFR 372.45), 313 Reportable Components

No 313-listed chemicals in this product

Clean Air Act VOC Section 111 Ethyl lactate

State Right-to-Know Regulations Status of Ingredients

Pennsylvania:	Propanoic acid, 2-hydroxy-, ethyl ester
New Jersey:	Ethyl lactate
Massachusetts:	Ethyl lactate

16. OTHER INFORMATION

MSDS REVISION STATUS:
Section(s) Revised: 2, 3, 7, 8, 12, 14, 15, 16

MAJOR REFERENCES:

- Curren, R.D. and Mecchi, M.S., Final Report, Salmonella/Mammalian Microsome Plate Incorporation Mutagenicity Assay for Ethyl Lactate. MBA, T 8281.501, October 11, 1988.
- Hoberman, A.M., Final Report, Developmental Toxicity Study of Ethyl Lactate Administered Percutaneously to Crl:CD (SD) BR Presumed Pregnant Rats. Argus Research Laboratories, Inc., September 8, 1989.

- Curren, R.D., and Mecchi, M.S., Final Report, Salmonella/Mammalian- Microsome Plate Incorporation Mutagenicity Assay for Ethyl Lactate.MBA, T 8281.501, October 11, 1988.
- Hoberman, A.M., Final Report, Developmental Toxicity Study of Ethyl Lactate Administered Percutaneously to Crl:CD (SD) BR Presumed Pregnant Rats. Argus Research Laboratories, Inc., September 8, 1989.
- Eastman Chemical Products, Inc., Kingsport, Tennessee, MSDS "Ektapro"EEP Solvent, July 7, 1992.
- Krasavage, Walter, J. and Gary V. Katz, The Developmental Toxicity ofEthyl-3-Ethoxypropionate in the Rat. Eastman Kodak Company Unpublished Report. June 25, 1984.
- An Inhalation Developmental Toxicity Study in Rabbits with Ethyl3-Ethoxypropionate. Bio/dynamics, Inc. East Millstone, NJ, Project No. 86-3035, March 17, 1987.
- Boggs, A., A Comparative Risk Assessment of Casting Solvents for Positive Photoresists, Appl. Ind. Hyg. 4(4):81-87, 1989.

- Arch Unpublished Report, "Odor Threshold Studies Performed withMethyl-3-Methoxypropioante, Ethyl-3-Ethoxypropionate, Propylene Glycol Methyl Ether Acetate and Ethyl Lactate", Prepared by TRC Environmental Corporation, Windsor, CT, TRC #1615-0000-00000,September 26, 1994.

Other references available upon request.