

**1. Identification**

**Material name** HPR 504  
**Issue date** 11-February-2015  
**Revision date** -  
**Supersedes date** -  
**Other means of identification**  
**Spec ID** 10000002088  
**Synonyms** None.  
**Recommended use** Positive photoresist.  
**Recommended restrictions** None known.  
**Supplier information**

FUJIFILM Electronic Materials U.S.A., Inc.  
 80 Circuit Drive  
 North Kingstown RI 02852  
 Transportation Emergency:  
 FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC: 1-800-424-9300  
 Medical Emergency (24HR):  
 FOR ANY HEALTH & MEDICAL EMERGENCY, 24 HOURS /7 DAYS CALL:  
 1-800-365-8951  
 Non-emergency Telephone:  
 FOR ALL SDS REQUESTS & QUESTIONS, CALL CUSTOMER SERVICE:  
 1-800-553-6546

**SDS file** 10532\_US\_EN\_V1.0  
**Replaces file** None

**2. Hazard(s) identification**

**Physical hazards** Flammable liquids Category 3  
**Health hazards** Serious eye damage/eye irritation Category 1  
 Specific target organ toxicity, single exposure Category 3 respiratory tract irritation  
**OSHA defined hazards** Not classified.

**Label elements**

**Signal word** Danger  
**Hazard statement** Flammable liquid and vapor. Causes serious eye damage. May cause respiratory irritation.  
**Precautionary statement**  
**Prevention** Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Wear protective gloves/protective clothing/eye protection/face protection. Avoid breathing mist/vapors/spray. Use only outdoors or in a well-ventilated area.  
**Response** If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell. In case of fire: Use foam, carbon dioxide, dry powder or water fog for extinction.  
**Storage** Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store locked up.  
**Disposal** Dispose of contents/container in accordance with local/regional/national/international regulations.  
**Hazard(s) not otherwise classified (HNOC)** None known.

**3. Composition/information on ingredients****Mixture**

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Chemical name	Common name and synonyms	CAS number	%
Ethyl-(S)-lactate		687-47-8	60-90
<b>Composition comments</b>	All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The product contains: Novolac resin. Naphthoquinone diazide ester derivative.		
<b>4. First-aid measures</b>			
<b>Inhalation</b>	Move injured person into fresh air and keep person calm under observation. Get medical attention if any discomfort continues.		
<b>Skin contact</b>	Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention if irritation develops and persists.		
<b>Eye contact</b>	Immediately flush with plenty of water for at least 15 minutes. Remove any contact lenses and open eyelids wide apart. Get medical attention immediately. Continue to rinse.		
<b>Ingestion</b>	Rinse mouth thoroughly with water and give large amounts of milk or water, if person is conscious. Only induce vomiting at the instruction of medical personnel. Get medical attention if any discomfort continues.		
<b>Most important symptoms/effects, acute and delayed</b>	Inhalation: Vapors may cause drowsiness and dizziness. Eye contact: Can cause corneal opacity. Skin contact: Defats the skin.		
<b>Indication of immediate medical attention and special treatment needed</b>	Treat symptomatically.		
<b>General information</b>	Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital.		
<b>5. Fire-fighting measures</b>			
<b>Suitable extinguishing media</b>	The product is flammable, and heating may generate vapors which may form explosive vapor/air mixtures. Extinguish with foam, carbon dioxide, dry powder or water fog.		
<b>Unsuitable extinguishing media</b>	None.		
<b>Specific hazards arising from the chemical</b>	During fire, gases hazardous to health may be formed. Solvent vapors may form explosive mixtures with air.		
<b>Special protective equipment and precautions for firefighters</b>	Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.		
<b>Fire fighting equipment/instructions</b>	Use standard firefighting procedures and consider the hazards of other involved materials. Containers close to fire should be removed or cooled with water.		
<b>6. Accidental release measures</b>			
<b>Personal precautions, protective equipment and emergency procedures</b>	Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Ventilate the area. Avoid inhalation of vapors/spray and contact with skin and eyes. Wear suitable protective clothing. See Section 8 of the SDS for Personal Protective Equipment.		
<b>Methods and materials for containment and cleaning up</b>	Remove sources of ignition. Absorb spillage with non-combustible, absorbent material. For waste disposal, see Section 13 of the SDS.		
<b>Environmental precautions</b>	Avoid discharge into drains, water courses or onto the ground unless authorized by permit.		
<b>7. Handling and storage</b>			
<b>Precautions for safe handling</b>	Local exhaust is recommended. Avoid inhalation of vapors and spray mist and contact with skin and eyes. Wear approved safety goggles. Wear protective gloves and appropriate clothing to prevent skin contact. The product is flammable, and heating may generate vapors which may form explosive vapor/air mixtures. Do not smoke and do not spray near an open flame or other sources of ignition. Vapors are heavier than air and may travel along the floor and in the bottom of containers. Vapors may be ignited by a spark, a hot surface or an ember. Take precautionary measures against static discharges. Observe good industrial hygiene practices.		
<b>Conditions for safe storage, including any incompatibilities</b>	Follow rules for flammable liquids. Keep away from heat, sparks and open flame. Do not store near heat sources or expose to high temperatures. Store in closed original container in a dry place. Store away from incompatible materials.		
<b>8. Exposure controls/personal protection</b>			
<b>Occupational exposure limits</b>	No exposure limits noted for ingredient(s).		
<b>Biological limit values</b>	No biological exposure limits noted for the ingredient(s).		
<b>Appropriate engineering controls</b>	Use explosion-proof equipment. Provide adequate ventilation. Provide easy access to water supply or an emergency shower.		

## Individual protection measures, such as personal protective equipment

<b>Eye/face protection</b>	Wear approved safety goggles.
<b>Skin protection</b>	
<b>Hand protection</b>	Wear protective gloves impervious to the chemicals in use.
<b>Other</b>	Also wear appropriate clothing to prevent any possibility of skin contact. Suitable items can be recommended by the protective equipment supplier or by a qualified industrial hygienist.
<b>Respiratory protection</b>	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 1910.134. Use a NIOSH/MSHA approved air purifying respirator as needed to control exposure. Consult with respirator manufacturer to determine respirator selection, use, and limitations. Use positive pressure, air-supplied respirator for uncontrolled releases or when air purifying respirator limitations may be exceeded. Follow respirator protection program requirements (OSHA 1910.134 and ANSI Z88.2) for all respirator use.
<b>Thermal hazards</b>	Wear appropriate thermal protective clothing, when necessary.
<b>General hygiene considerations</b>	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

## 9. Physical and chemical properties

### Appearance

<b>Physical state</b>	Liquid.
<b>Form</b>	Liquid.
<b>Color</b>	Yellow-red.
<b>Odor</b>	Mild, ester-like.
<b>Odor threshold</b>	No data available.
<b>pH</b>	Not applicable.
<b>Melting point/freezing point</b>	No data available.
<b>Initial boiling point and boiling range</b>	No data available.
<b>Flash point</b>	140.0 °F (60.0 °C) Closed Cup (Solvent)
<b>Evaporation rate</b>	0.20-0.29 (n-Butyl acetate = 1)
<b>Flammability (solid, gas)</b>	Not applicable.
<b>Upper/lower flammability or explosive limits</b>	
<b>Flammability limit - lower (%)</b>	No data available.
<b>Flammability limit - upper (%)</b>	No data available.
<b>Vapor pressure</b>	1.5 - 2 mm Hg (25°C)
<b>Vapor density</b>	3.5 - 4.1 (Air = 1.0)
<b>Solubility(ies)</b>	
<b>Solubility (water)</b>	No data available.
<b>Partition coefficient (n-octanol/water)</b>	No data available.
<b>Auto-ignition temperature</b>	No data available.
<b>Decomposition temperature</b>	122 °F (50 °C) (After removal of solvents)
<b>Viscosity</b>	No data available.
<b>Other information</b>	
<b>Molecular weight</b>	Not applicable/mixture.
<b>Percent volatile</b>	60 - 80 %

## 10. Stability and reactivity

<b>Chemical stability</b>	Stable under normal temperature conditions.
<b>Possibility of hazardous reactions</b>	Will not occur.
<b>Conditions to avoid</b>	Heat, sparks, flames.
<b>Incompatible materials</b>	Strong oxidizing agents. Strong acids.

**Hazardous decomposition products** At elevated temperatures: Carbon dioxide. Carbon monoxide. Sulfur oxides. Nitrogen oxides.

## 11. Toxicological information

### Information on likely routes of exposure

**Inhalation** May cause respiratory irritation.  
**Skin contact** May cause skin irritation.  
**Eye contact** Causes serious eye damage.  
**Ingestion** May cause discomfort if swallowed.

**Symptoms related to the physical, chemical and toxicological characteristics** Inhalation: Vapors may cause drowsiness and dizziness. Eye contact: Can cause corneal opacity. Skin contact: Defats the skin.

### Information on toxicological effects

#### Acute toxicity

Components	Species	Test Results
Ethyl-(S)-lactate (CAS 687-47-8)		
<b>Acute</b>		
<i>Inhalation</i>		
LC50	Rat	> 5.4 mg/l, 4 Hours
<i>Oral</i>		
LD50	Rat	> 2000 mg/kg

**Skin corrosion/irritation** May cause skin irritation.

**Serious eye damage/eye irritation** Causes serious eye damage.

#### Respiratory or skin sensitization

**Respiratory sensitization** No data available.

**Skin sensitization** Not a skin sensitizer.

**Germ cell mutagenicity** No data available.

**Carcinogenicity** No data available for this product.

#### OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

**Reproductive toxicity** No data available.

**Specific target organ toxicity - single exposure** May cause respiratory irritation.

**Specific target organ toxicity - repeated exposure** No data available.

**Aspiration hazard** Not classified.

**Chronic effects** High concentrations: Organic solvents may be absorbed into the body by inhalation and cause permanent damage to the nervous system, including the brain.

## 12. Ecological information

**Ecotoxicity** The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components	Species	Test Results
Ethyl-(S)-lactate (CAS 687-47-8)		
<b>Aquatic</b>		
Crustacea	EC50 Daphnia magna	683 mg/l, 48 Hours
Fish	LC50 Danio rerio	320 mg/l, 96 Hours

**Persistence and degradability** No data available.

**Bioaccumulative potential** No data available.

**Mobility in soil** No data available.

**Mobility in general** The product is slightly soluble in water. The product contains organic solvents which will evaporate easily from all surfaces.

**Other adverse effects** The product contains a substance which has a photochemical ozone creation potential.

### 13. Disposal considerations

<b>Disposal instructions</b>	Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.
<b>Hazardous waste code</b>	D001: Waste Flammable material with a flash point <140 °F
<b>Waste from residues / unused products</b>	Dispose of waste and residues in accordance with local authority requirements.
<b>Contaminated packaging</b>	Empty containers should be taken to an approved waste handling site for recycling or disposal.

### 14. Transport information

<b>DOT</b>	
<b>UN number</b>	UN1192
<b>UN proper shipping name</b>	Ethyl lactate solution
<b>Transport hazard class(es)</b>	
<b>Class</b>	3
<b>Subsidiary risk</b>	-
<b>Label(s)</b>	3
<b>Packing group</b>	III
<b>Environmental hazards</b>	
<b>Marine pollutant</b>	No
<b>Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling. This material can be reclassified as a combustible liquid and is considered not regulated by ground transport when packaged in non-bulk packaging (<119 G). This exception is found in 49 CFR 173.150(f).
<b>Special provisions</b>	B1, IB3, T2, TP1
<b>Packaging exceptions</b>	150
<b>Packaging non bulk</b>	203
<b>Packaging bulk</b>	242

<b>IATA</b>	
<b>UN number</b>	UN1192
<b>UN proper shipping name</b>	Ethyl lactate solution
<b>Transport hazard class(es)</b>	
<b>Class</b>	3
<b>Subsidiary risk</b>	-
<b>Label(s)</b>	3
<b>Packing group</b>	III
<b>Environmental hazards</b>	No
<b>ERG Code</b>	3L
<b>Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling.

<b>IMDG</b>	
<b>UN number</b>	UN1192
<b>UN proper shipping name</b>	ETHYL LACTATE SOLUTION
<b>Transport hazard class(es)</b>	
<b>Class</b>	3
<b>Subsidiary risk</b>	-
<b>Label(s)</b>	3
<b>Packing group</b>	III
<b>Environmental hazards</b>	
<b>Marine pollutant</b>	No
<b>EmS</b>	F-E, S-D
<b>Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling.
<b>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b>	None known.

### 15. Regulatory information

<b>US federal regulations</b>	This product is hazardous according to OSHA 29 CFR 1910.1200. TSCA Section 4(a) Final Test Rules & Testing Consent Orders: Not regulated. TSCA Section 5(e) PMN-Substance Consent Orders: Not regulated.
<b>Drug Enforcement Administration (DEA). List 1(i), Precursor Chemicals (21 CFR 1310.02(a) and 1310.04(f)(1))</b>	Not listed.
<b>TSCA Section 5(a)(2) Final Significant New Use Rules (SNURs)(40CFR 721, Subpt. E)</b>	Not regulated.
<b>TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)</b>	Not regulated.

**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Not regulated.

**CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)**

None

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories**  
Immediate Hazard - Yes  
Delayed Hazard - No  
Fire Hazard - Yes  
Pressure Hazard - No  
Reactivity Hazard - No

**Section 302 extremely hazardous substance (40 CFR 355, Appendix A)**  
No

**Section 311/312 (40 CFR 370)**  
Yes

**Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)**  
Not controlled

**Inventory status**

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

All ingredients are TSCA compliant.

\*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s)

**State regulations** This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

**US. Massachusetts RTK - Substance List**

Ethyl-(S)-lactate (CAS 687-47-8) Listed.

**US. New Jersey Worker and Community Right-to-Know Act**

Ethyl-(S)-lactate (CAS 687-47-8)

**US. Pennsylvania Worker and Community Right-to-Know Law**

Ethyl-(S)-lactate (CAS 687-47-8)

**US. Rhode Island RTK**

Not regulated.

**16. Other information, including date of preparation or last revision**

**Further information** HMIS® is a registered trade and service mark of the NPCA.  
G - Safety Glasses, Gloves, Vapor Respirator

**HMIS® ratings**  
Health: 3  
Flammability: 2  
Physical hazard: 0  
Personal protection: G

**NFPA ratings**  
Health: -  
Flammability: -  
Instability: -

**List of abbreviations**  
LD50: Lethal Dose, 50%.  
LC50: Lethal Concentration, 50%.  
EC50: Effective concentration, 50%.

**Disclaimer**

THIS SAFETY DATA SHEET (SDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION IN THIS SDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. FUJIFILM PLANAR SOLUTIONS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS SDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT FUJIFILM PLANAR SOLUTIONS AT THE PHONE NUMBER 1-800-553-6546 (CUSTOMER SERVICE) TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.

**SDS file**

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**Replaces file**

None