



Fine-L-Kote™ UR

Urethane Conformal Coating

2104

Introduction

As a urethane conformal coating, Fine-L-Kote™ UR is highly resistant to most solvents, moisture, fungus and molds. A clear, repairable coating, Fine-L-Kote™ UR is formulated with a black light indicator, Opti/Scan™, to provide checks for conformity in quality control. Coated boards can be reworked by applying soldering iron directly to coating, or complete removal can be achieved by using Trace Technologies™ Conformal Coating Remover (2510-N, 2510-P).

Features / Benefits

- Solvent Resistant
- Recommended for Harsh Environments
- Flexible
- Contains Opti/Scan™

Chemical Components

Propyl acetate.....	(109-60-4)	25-30%-Aerosol 49-53%-Bulk
Urethane Prepolymer		<10%-Aerosol 19-23%-Bulk
Cyclotetramethylene oxide.....	(109-99-9)	15-20%
Aerosol-Tetrafluoroethane.....	(811-97-2)	30-35%
Xylene.....	(1330-20-7)	9.28%-Aerosol <20-24%-Bulk
Bulk-Ethyl Benzene.....	(100-41-4)	<5-8%
Bulk-Optical Brightener		<.1%

Cure Type	Thermal
Meets/Exceeds IPC-CC-830 MIL-I-46058C	UR Urethane
Thermal Shock	3
Dielectric Constant (@ 10 ⁵ Hz)	4.36
Dielectric Strength (Volts/Mill)	315
Volume Resistivity	2x10 ¹³
Moisture Resistance	4
Resistant to Fungus	Yes
Ease of Repair	3
Flexibility	3
Chemical Resistance	4
Dry Time to Touch	15 min.
Cure Time	24 Hours
Accelerated Cure Time	20 min. @ 120°F 30 min. @ 180°F Two Step Process
Removal (2510-P or 2510-N)	1-5 min.
Burn Through	Yes

Ratings: 5 (Excellent), 4 (Very Good), 3 (Good), 2 (Fair), 1 (Poor)

Typical Properties for 2104

Uncured Liquid Bulk		
Gardener Color		1
Solids (%)		40
Viscosity (cps) Bulk / HV		10-20 / 150-250
NCO Content (%)		2.9
Pounds/Gallon		8.1
Flash Point (°F)		81
Wet Film (40% solids, 3 mil thickness)*		*All conditions of test at 50% R.H. and 72°F
Set to Touch (minutes)		10
Surface Dry (minutes)		45
Hard Dry (hours)		4
Full Cure (hours)		12
Sward Hardness (1 day)		2
Cured Film		
Mechanical Properties		
Color of Film		Clear
Sward Hardness		38
Taber Abrasion Loss (mg) (1000g load, 1000 cycles)		
cs 10 wheel		18
cs 17 wheel		28
Tensile Strength (psi)		5,000
Elongation (%) (20 in/min. Instron)		85
Impact Resistance (pounds)		
Direct		160
Reverse		140
Thermal Shock (Mil -I-46058C, UR)		Passes
(-65°C - + 125°C for appearance – doesn't crack)		
Electrical Properties		
Dielectric Strength (volts/mil)		380
Dielectric Constant	(60 hz)	4.1
	(10 ⁶ hz)	3.8
Insulation Resistance (ohms)		1.5 x 10 ¹²

Environmental Policy

Techspray® is committed to developing products to ensure a safer and cleaner environment. We will continue to meet and sustain the regulations of all federal, state and local government agencies.

Packaging and Availability

Fine-L-Kote™ UR may be ordered in the following container sizes:

2104-12S	12 Ounce Aerosol
2104-P	1 Pint in Glass
2104-PHV	1 Pint in Glass
2104-G	1 Gallon in Metal
2104-GHV	1 Gallon in Metal
2104-5G	5 Gallons in Metal Pail

FINE-L-KOTE™ COATING SELECTION CHART

Fine-L-Kote™ Part Number	2102	2103	2104	2106
Cure Type	Thermal	Thermal	Thermal	Thermal
Meets / Exceeds IPC-CC-830 MIL-I-46058C	SR Silicone	AR Acrylic	UR Urethane	SR Silicone
Thermal Shock	5	2	3	5
Dielectric Constant (@ 10 ⁶ Hz)	2.66	3.1	3.80	2.5
Dielectric Strength (Volts / Mil)	1100 Dry 976 Wet	2086	380	560
Volume Resistivity	1x10 ¹⁴ Dry 9x10 ¹⁴ Wet	4x10 ¹³ Dry	2x10 ¹³	5x10 ¹³
Moisture Resistance	5	2	4	5
Resistant to Fungus	Yes	Yes	Yes	Yes
Ease of Repair	3	5	2	3
Flexibility	5	2	3	5
Chemical Resistance	4	1	4	2
Dry Time To Touch	1 Hour	15 Min.	15 Min.	45 Min.
Cure Time	72 Hours	24 Hours	24 Hours	24 Hours
Accelerated Cure Time	30 min. @ 90°F 45 min. @ 200°F Two Step Process	20 min. @ 120°F 30 min. @ 180°F Two Step Process	20 min. @ 120°F 30 min. @ 180°F Two Step Process	15 min. @ 120°F One Step Process
*Removal (2510)	1-5 min.	1-5 min.	1-5 min.	1-5 min.
Burn Through	Yes	Yes	Yes	Yes

Ratings: 5 - Excellent, 4 - Very Good, 3 - Good, 2 - Fair, 1 - Poor
All coatings may be thinned by using Fine-L-Kote™ UR Thinner (2105)

* Available: Conformal Coating Remover
Product #'s: 2510-P and 2510-N



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MATERIAL SAFETY DATA SHEET

Finished Product

MSDS Ref. No: 2104-12S

Fine-L-Kote UR

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Fine-L-Kote UR**PRODUCT DESCRIPTION:** Urethane Conformal Coating**PRODUCT CODE:** 2104/CAN/EUR-12S

MANUFACTURER

Techspray, L.P.

2. COMPOSITION / INFORMATION ON INGREDIENTS

<u>Chemical Name</u>	<u>Wt.%</u>	<u>CAS#</u>	<u>EINECS#</u>
n-Propyl acetate	20 - 30	109-60-4	2036861
Urethane prepolymer	15 - 30		
Xylenes (o-,m-,p- isomers)	20 - 24	1330-20-7	
ethylbenzene	5 - 8	100-41-4	202-849-4
Tetrahydrofuran	15 - 20	109-99-9	203-726-8
1,1,1,2-Tetrafluoroethane (HFC-134a)	25 - 40	811-97-2	223770

EEC LABEL SYMBOL AND CLASSIFICATION



R11 - Highly flammable.

EEC Highly flammable - "F"

4. FIRST AID MEASURES

EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Get immediate medical attention.

SKIN: Immediately flush with large amounts of water. Use soap if available. Remove contaminated clothing, including shoes, after flushing has begun. Get prompt medical attention.

INGESTION: Do not induce vomiting. Give milk or water. Get immediate medical attention immediately.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Seek immediate medical attention.

5. FIRE FIGHTING MEASURES

FLASHPOINT AND METHOD: 27.2°C (81°F)TAG CC

FLAMMABLE LIMITS: LEL: 1.0% to UEL: 7.0%

GENERAL HAZARD: Flammable Liquid. Can release vapors that form explosive mixtures at temperatures at or above the flash point.

EXTINGUISHING MEDIA: Water, foam, dry chemical, carbon dioxide.

HAZARDOUS COMBUSTION PRODUCTS: Smoke, fumes and oxides of carbon.

EXPLOSION HAZARDS: Vapors may form explosive mixture with air.

FIRE FIGHTING PROCEDURES: Use water spray to keep fire-exposed containers cool and to knock down vapors which may result from product decomposition.

FIRE FIGHTING EQUIPMENT: As in any fire, wear self-contained breathing apparatus pressure-demand, (MSHA/NIOSH approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover spilled material on adsorbent, such as sawdust or vermiculite, and sweep into closed containers for disposal. After all visible traces, including ignitable vapors, have been removed thoroughly wet vacuum the area. Do not flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc. as necessary and place in closed containers for disposal.

GENERAL PROCEDURES: Forms smooth, slippery surfaces on floors, posing an accident risk. Wear a self-contained breathing apparatus and appropriate personal protective equipment. (See Exposure Controls/Personal Protection Section). Contain spilled liquid with sand or earth. DO NOT use combustible materials such as sawdust.

7. HANDLING AND STORAGE

must be followed whenever workplace conditions warrant a respirator's use.

WORK HYGIENIC PRACTICES: Wash hands before eating and wash before reuse.

OTHER USE PRECAUTIONS: Emergency shower and eyewash facility should be in close proximity.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Liquid

ODOR: Aromatic odor.

APPEARANCE: Clear water-white viscous liquid with aromatic odor.

COLOR: Colorless

PERCENT VOLATILE: 60

VAPOR DENSITY: >1 (Air=1)

BOILING POINT: 149°C (300°F)

FREEZING POINT: Not Determined

SOLUBILITY IN WATER: Insoluble

EVAPORATION RATE: Not Established

DENSITY: 0.93

(VOC): 744 g/L (non-exempt VOC)

10. STABILITY AND REACTIVITY

STABLE: YES

HAZARDOUS POLYMERIZATION: NO

CONDITIONS TO AVOID: Heat, flames, ignition sources, and incompatibles.

STABILITY: Stable.

POLYMERIZATION: Occurs with water.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of Carbon (CO and CO₂) may form when heated to decomposition.

INCOMPATIBLE MATERIALS: Metals. Acidic conditions. Oxidizing materials.

11. TOXICOLOGICAL INFORMATION

ACUTE

EYES: 20 mg

Moderately to severely irritating

DERMAL LD₅₀: >20 mg/kg (rabbit)

ORAL LD₅₀: 9370 mg/kg (rat)

IMDG NOTE: Page 2102

EUROPEAN TRANSPORTATION:

ADR/RID HAZARD CLASSIFICATION: 2.1

ADR/RID ITEM NUMBER: UN1950

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

311/312 HAZARD CATEGORIES: IMMEDIATE / DELAYED

FIRE: YES PRESSURE GENERATING: YES ACUTE: YES CHRONIC: YES

313 REPORTABLE INGREDIENTS: Xylene Ethylbenzene

CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)

CERCLA REGULATORY: Listed in table 302.4 of 40CFR Part 302 as a hazardous substance with a reportable quantity. Releases to air, land, or water which exceed the RQ must be reported to the national response center.

CERCLA RQ: 1000 Lbs.

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA STATUS: All chemicals in this product are listed in the TSCA inventory.

RCRA STATUS: U239 D001

OSHA HAZARD COMM. RULE: Contents of this MSDS comply with the OSHA Hazard Communication Standard 29 CFR 1910.1200.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

29 CFR 1910.119---PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS

CHEMICALS: None of the chemicals in this product are considered highly hazardous by OSHA.

CANADA

WHMIS (WORKER HAZARDOUS MATERIALS INFORMATION SYSTEM): This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

WHMIS CLASS: Class A, B5, D2B (Aerosol, Flammable Aerosol, Toxic Materials)

EUROPEAN COMMUNITY

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