

ENTHONE® 10-000 Series Permanent Legend Ink

DESCRIPTION

10-000 Series Legend Ink is a permanent one component, epoxy-based, screen printing ink. When properly cured, 10-000 Series Ink will have excellent adhesion to conventional and UV curable, liquid photoimageable and dry film solder resist. Additionally, 10-000 series adheres to glass, plastics and metals. 10-000 Series Ink is resistant to acids, alkalies, solvents, fluxes and soldering operations.

Primary uses of 10-000 Series Ink include the marking of circuit boards, dials, metal, nameplates, components, glass, thermoplastics, and laser mark applications.

Benefits:

- | | |
|------------------------------------|-------------------------|
| * Less yellowing | * No mixing |
| * Sharper printing (thixotropic) | * Less waste |
| * Laser markable | * Long screen open time |
| * Withstands all soldering methods | |

COLORS

10-105 White
10-205 Yellow

POT LIFE

Because 10-000 series is a one component thermal cure ink, there is no catalyzed pot life. The only restrictions are caused by solvent evaporation and shelf life (see 4.0).

SHELF LIFE

10-000 Series Ink has a five month shelf life when stored at room temperature, 25°C (77°F). The shelf life will be considerably shortened if stored above 77°F. The container lid should be kept tightly sealed when not in use to avoid solvent evaporation and/or contamination. Shelf life may be prolonged by storing in a cool room, 4°C (40°F). Avoid freezing (also see 10.0).

METHOD OF APPLICATION

GENERAL: 10-000 Series Ink is slow drying and designed specifically for screen printing, but may also be rubber stamped, pad printed or sprayed.

SCREEN PRINTING: Monofilament polyester fabrics with mesh counts from 180-330 tpi may be used. Mesh tension should be to manufacturer's recommendations. Stencil material should be lacquer resistant direct, indirect, direct/indirect or capillary systems. Squeegee durometer, pressure, angle and speed should be adjusted according to overall printing parameters to ensure appropriate print definition.

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THINNING: For those types of equipment for which increased fluidity is required, AD2003 thinner may be added without affecting the cured film. AD2003 should be used if ink is to be sprayed. Other thinners may be harmful to the ink or the surface being marked. The thinner should be added sparingly to maintain proper drying body, color and adhesion.

REMOVAL: AD2001 or an good lacquer-wash thinner will effectively clean screens and equipment. An epoxy stripper can be used to remove cured ink if the substrate will withstand its action.

RECOMMENDED CURING

CURE SCHEDULE:

45-60 minutes @ 135°C

30-45 minutes @ 150°C - Preferred

ADDITIONAL CURING INFORMATION:

Cure schedule denotes times/temperatures for curing ink film only. Additional time should be provided to allow substrate to reach curing temperature. Convection ovens should have sufficient air movement to ensure solvent removal.

Adhesion to certain substrates such as glass and nickel requires a slightly longer cure time to achieve optimum results.

TYPICAL UNCURED PROPERTIES

Values are not intended for use in preparation of specifications. All measurements were taken at 25°C (77°F) unless otherwise noted. Contact your local Enthone representative for information regarding specification values.

	<u>10-105</u>	<u>10-205</u>	<u>Test Method</u>
Color:	White	Yellow	DITM 0004-C
Specific gravity @ 25/C:	1.42	1.60	DITM 0009-A
Viscosity @ 25/, centipoise:			DITU0002-1
Brookfield RVF			
Spindle No. 6 @ 20 rpm:	22,000	24,000	
Shelf life @ 25/C (77/F), months:	5	5	
Flash Point:	>200/F	>200/F	Seta Flash
Volatile organic content (VOC)			
Calculated, grams/liter:	374	393	
Calculated, lbs/gallon:	3.12	3.28	
SCAQMD Method 24, grams/liter:	288	320	SCAQMD Method 24
SCAQMD Method 24, lbs/gallon:	2.40	2.67	SCAQMD Method 24
Abrasion resistance:			IPC-SM-840B, 3.5.1.1
Taber method, cycles:	60	220	50 cycles min
Pencil hardness:	6H	6H	AF@ min
Adhesion, % loss before solder immersion:			IPC-SM-840B, 3.5.2.1
Bare copper:	0	0	0%
Gold:	0	0	5% max
Nickel:	0	0	5% max
Base laminate:	0	0	0%
Tin-lead:	0	0	10% max
Adhesion, % loss after solder immersion:			IPC-SM-840B, 3.5.2.1
Bare Copper:	0	0	0%
Gold:	0	0	5% max
Nickel:	0	0	5% max
Base laminate:	0	0	0%
Tin-lead:	20	1	10% max
Adhesion - cross hatch tape, % loss:			ASTM D3359
SR8100:	0	0	Method B
SR8200:	0	0	

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	<u>10-105</u>	<u>10-205</u>	<u>Test Method</u>
Dielectric strength, volts/mil:	1,600	600	IPC-SM-840B, 3.8.1 500 volts/mil min
Insulation resistance, ohms:			IPC-SM-840B, 3.8.2
10/12 mil pattern (IPC B-25):			
@ 25/C:	2.0 x E ¹³	7.6 x E ¹³	5.0 x E ⁸ ohms min
@ 35/C & 85% R.H.:	2.8 x E ¹²		
after 100 hours:	1.4 x E ¹²		
25/50 mil Pattern:			
@ 25/C:	5.0 x E ¹⁴		
@ 35/C & 85% R.H.:	1.0 x E ¹⁴		
after 100 hours:	1.0 x E ¹⁴		
Hydrolytic stability/aging - 28 days @ 100°C & 90+% R.H.:			IPC-SM-840B, 3.6.2
on Copper:	Pass	Pass	
on SR8100:	Pass	Pass	
on SR8200:	Pass	Pass	
Electromigration @ 85°C & 90% R.H.:	Pass	Pass	IPC-SM-840B, 3.9.2
	24.0	24.0	2.0 megohms min
Resistance to solvents 10-105 & 10-205:			IPC-SM-840B, 3.6.1
	<u>On SR8100</u>	<u>On SR8200</u>	
Isopropanol:	Pass	Pass	
1,1,1-trichloroethane:	Pass	Pass	
Azeotrope (ethanol & trichloro-trifluoroethane) vapor degrease:	Pass	Pass	
Alkaline detergent @ 57°C:	Pass	Pass	

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	<u>10-105</u>	<u>10-205</u>	<u>Test Method</u>
Visual:	Pass	Pass	IPC-SM-840B, 3.4.7
Adhesion, % loss before solder immersion:	Pass	Pass	IPC-SM-840B, 3.5.2.1
Bare copper:	0	0	0%
Gold:	0	0	5% max
Nickel:	0	0	5% max
Base laminate:	0	0	0%
Tin-lead:	0	0	10% max
Adhesion, % loss after solder immersion:	Pass	Pass	IPC-SM-840B, 3.5.2.1
Bare copper:	0	0	0%
Gold:	0	0	5% max
Nickel:	0	0	5% max
Base laminate:	0	0	0%
Tin-lead:	20	1	10% max
Abrasion resistance:			IPC-SM-840B, 3.5.1.1
Taber method, cycles:	60	220	50 cycles min
Pencil hardness:	6H	6H	AF@ min
Resistance to solder:	Pass	Pass	IPC-SM-840B, 3.7.1
Electromigration @ 85°C & 85% R.H.:	Pass	Pass	TR-78, 13.2.7
Resistance after 1 day, ohms:	1.5 x E ⁷	5.8 x E ⁶	2.0 x E ⁶ ohms min
Resistance after 4 days, ohms:	7.3 x E ⁶	2.0 x E ⁷	2.0 x E ⁶ ohms min
Resistance after 7 days, ohms:	2.4 x E ⁷	2.4 x E ⁷	2.0 x E ⁶ ohms min
Resistance after 21 days, ohms:	2.0 x E ⁷	3.4 x E ⁸	2.0 x E ⁶ ohms min
Insulation resistance @ 35°C & 85% R.H.:			
After 4 days:	1.0 x E ₁₂	1.0 x E ₁₂	

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TROUBLESHOOTING

Problem	Cause	Remedy
Bleed through mesh	1) Improper flooding 2) Mesh too coarse	1) Reduce flood pressure 2) Use finer mesh
Poor curing	1) Insufficient air movement in oven 2) Insufficient cure schedule	1) Increase oven air circulation 2) Check cure schedule
Poor adhesion	1) Insufficient curing 2) Contamination on surface of parts	1) Check cure schedule 2) Clean part with acetone or isopropanol
Ink drying in screen	1) High shop temperature	1) Retard with AD2003 solvent or carbitol acetate
Printed ink film tacky	1) Improper curing 2) Insufficient air movement in oven	1) Check cure schedule, increase cure time and/or temperature 2) Increase oven air circulation

PACKAGING

10-000 series ink is available in quart, open top metal containers, and plastic gallon pails.

STORAGE AND HANDLING

10-000 series inks should be stored at room temperature (77°F maximum) or below, and out of direct sunlight. Shelf life may be prolonged by storage in a cool area, 4°C (40°F). Avoid freezing.

SAFETY

Information on the safety, health and environmental attributes of this product is set forth in the material safety data sheet (MSDS) and on the product label. Enthone provides the MSDS and product label to customers with all samples, as well as with the initial shipment of product and whenever an update is issued. Copies of the MSDS and label are also available at any time upon request.

The safety, health and environmental information set forth in the MSDS and label should be considered in determining the appropriateness of this product for any particular application, and should be used to determine appropriate engineering controls, protective equipment, work practices, and other precautions to be observed in the use of this product in any particular process or working environment.

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MATERIAL SAFETY DATA SHEETS

For more detailed information on the toxicological properties of the products described herein, reference can be made to the Material Safety Data Sheet (MSDS) for each product. If you do not have the proper MSDS, it can be requested from: Enthone Inc., attention: Regulatory Affairs Department, P.O. Box 1900, New Haven, CT 06508. For emergency assistance call CHEMTREC (800) 424-9300.

WARRANTY AND DISCLAIMER

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For detailed information on the toxicological properties of the products described herein, reference can be made to the Material Safety Data Sheet (MSDS) for each product. If you do not have a current MSDS, it can be requested from the W.H.M.I.S. coordinator, Enthone-OMI (Canada) Inc., 121 Watline Avenue, Mississauga, Ontario, L4Z-1P2. For emergency assistance regarding accidents with this product resulting in container rupture, spills, poisoning, bodily injury or threats to health call: CHEMTREC (800) 424-9300.

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CUSTOMER ORDER CENTERS

UNITED STATES		(800) 496-8326 Fax (203) 933-0249
SEL-REX® Precious Metal Products	(Phone: 8AM-6PM, M-F, East Coast time) (Fax: 24 hours, 7 days)	(800) 560-7214 Fax (203) 932-8688
CANADA	Mississauga Ontario Pointe Claire, Quebec	(800) 387-3766; (905) 507-9949 Fax (905) 507-9943 (514) 426-1451 Fax (514) 426-1453
MEXICO	Mexico, DF	(011-52-5) 587-1700 Fax (011-52-5) 567-6326

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