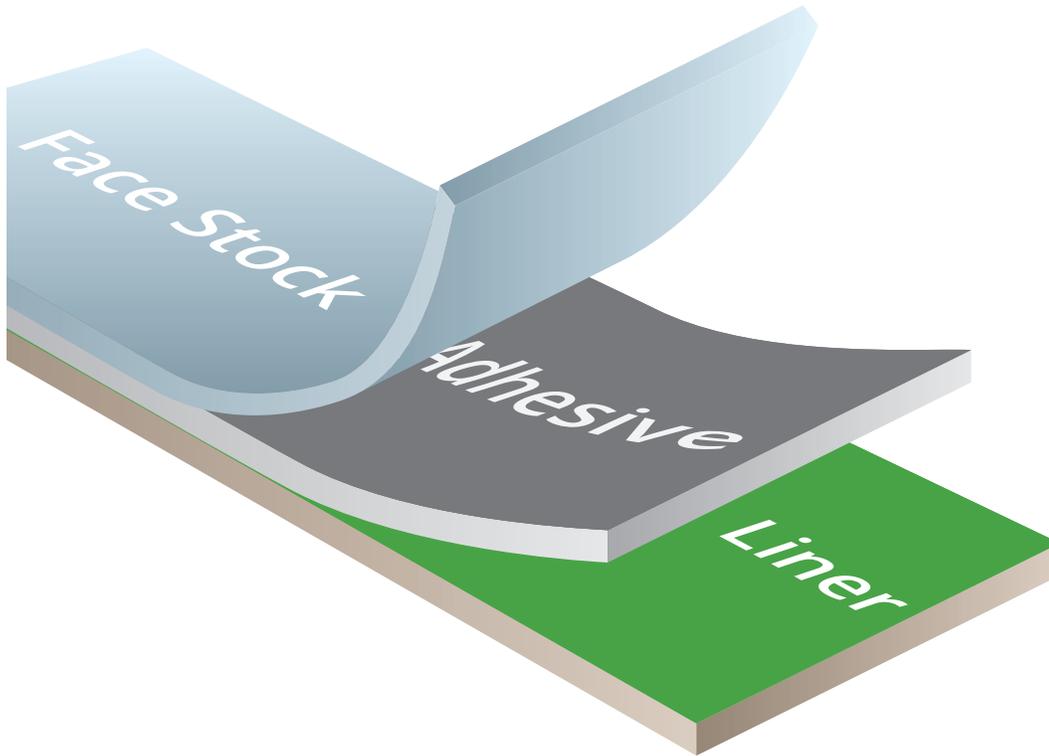


TT481



Labels for Life.



Face Stock: 1.5 mil topcoated gloss white polyimide film offering excellent chemical resistance combined with superior high heat resistance. The material will not curl and is designed to survive high temperatures of lead-free solder processes.

Adhesive: 1.1 mil high performance permanent acrylic pressure sensitive adhesive offering exceptional resistance to harsh PCB cleaning solvents and high heat.

Release Liner: 55# glassine liner designed to offer excellent performance.

Thermal Transfer Gloss White Polyimide Film

TT481 is designed for thermal transfer printing of variable information for circuit board labeling. This LOW PROFILE label material withstands exposure to most board cleaners and fluxes. TT481 performs well through most lead and lead-free reflow processes.

Typical Applications

In process circuit board labeling.

Typical Industry Sectors

Industrial

Electronics



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TT481

Thermal Transfer Gloss White Polyimide Film



Labels for Life.

 **Agency Recognitions**
UL-MH16873

 **Adhesion**

Stainless Steel	20 minute dwell	25 oz/in (28 N/100mm)	Epoxy PC Board	20 minute dwell	28 oz/in (31 N/100mm)
	24 hours dwell	28 oz/in (31 N/100mm)		24 hours dwell	32 oz/in (36 N/100mm)

 **Material Caliper**

Face Stock	.0015"	38.1 μ	Liner (glassine)	.0031"	78.7/38 Total
Adhesive	.0011"	27.9 μ	Material	0.0057 inch (0.145 mm)	

 **Exterior Durability**
Recommended for indoor use only.

 **Temperature Range**
Service Temperature: -40 °F to 302 °F (-40 °C to 150 °C)
Minimum Application Temperature: 50 °F (10 °C)
5 minutes @ 500 °F (260 °C)

 **Shelf Life**
Recommended Storage: 45-90 °F (7-32 °C) 20-75% R.H.
Shelf Life: 2 years @ recommended storage

 **Recommended Ribbons**
Thermal Transfer Printing
TTRR-B
TTRR-CR

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TT481

Thermal Transfer Gloss White Polyimide Film



Labels for Life.

Product Details

PHYSICAL PROPERTIES	TEST METHODS	AVERAGE RESULTS
Thickness	ASTM D 1000 Substrate (Topcoat & Film) Adhesive Liner (Glassine) Total	0.0015" (0.0381 mm) 0.0011" (0.0279 mm) 0.0031" (0.079 mm) 0.0057" (0.145 mm)
Adhesion to: Stainless Steel Expoy PC Board	ASTM D 1000 20 minute dwell 24 hours dwell 20 minute dwell 24 hours dwell	 25 oz/in (28 N/100mm) 28 oz/in (31 N/100mm) 28 oz/in (31 N/100mm) 32 oz/in (36 N/100mm)
Tack	ASTM 2979 Polyken Probe Tack 0.5 second dwell	 6 oz (180 g)
Drop Shear	PSTC-7 (1/2" x 1" sample)	>100 hours
Dielectric Strength	ASTM D1000	8,500 volts

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Labels for Life.

Performance Properties

PHYSICAL PROPERTIES	TEST METHODS	AVERAGE RESULTS
Short Term High Service Temperature	80 seconds at 572F (300C)	No visible effect
	5 minutes at 500F (260C)	No visible effect
	2 hours at 338F (170C)	No visible effect
Long Term High Service Temperature	1000 hours at 212F (100C)	No visible effect
Low Service Temperature	1000 hours at -94F (-70C)"	No visible effect
Humidity Resistance	1000 hours at 98F (37C), 95% R.H.	No visible effect
UV Light Resistance"	30 days in UV Sunlighter 100	Topcoat turns yellow, label remains functional
Weatherability	1000 hours in Xenon Arc Weatherometer	Slight discoloration
Salt Fog Resistance	ASTM B 117 30 days in 5% salt fog solution chamber	No visible effect
Abrasion Resistance	Taber Abraser, CS-10 grinding wheels, 500 g/arm (Fed. Std. 191A, Method 5306	Print legible after 100 cycles
Chemical Vapor Phase Resistance	Labels adhered to epoxy PC board and exposed to the vapor of the boiling chemical for 10 minutes and then rubbed with a cotton swab saturated with the chemical for 10 rubs. Testing samples were baked 4 minutes at 160C prior to testing Ionox 3955 Micronox MX2501"	Severe print removal Complete print removal

Performance properties tested on TT481 printed with IDENTCO Series TTRR-B thermal transfer ribbon. Printed samples of TT481 were laminated to aluminum and allowed to dwell 24 hours before exposure to the indicated environmental conditions.

* TT481 is not recommended for outdoor use.

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Performance Properties

PERFORMANCE PROPERTIES		CHEMICAL RESISTANCE		
CHEMICAL REAGENT		SUBJECTIVE OBSERVATION OF VISIBLE CHANGE		
	EFFECT TO LABEL	RIBBON PERFORMANCE: TTRR-B, TTRR-CR, TTRR-D		
		WITHOUT RUB	WITH RUB	
			TTRR-B	TTRR-CR
Kyzen Corp. 15% Aquanox® A4625 at 140F (60C)	No visible effect	1	4	3
Kyzen Corp. 17% Aquanox® A4520 at 140F (60C)	No visible effect	1	5	2
Kyzen Corp. 10% Aquanox® A4638 at 150F (65C)	No visible effect	1	1	1
Kyzen Corp. 20% Aquanox® A4703 at 145F (63C)	No visible effect	1	3	1
Zestron, 15% Atron® AC205 at 150F (65)	No visible effect	1	4	1
Zestron, 15% Atron® AC207 at 150F (65)	No visible effect	1	5	3
Zestron, 15% Vigon® A201 at 150F (65)	No visible effect	1	5	3
Zestron, 15% Vigon® N600 at 150F (65)	No visible effect	1	5	4
Isopropyl Alcohol 99% at 180F (82C)	No visible effect	1	1	1
Deionized Water AT 212F (100C)	No visible effect	1	1	1

Samples printed with TTRR-B & TTRR-CR thermal transfer ribbons. Samples laminated to epoxy PC board. Test samples exposed to indicated environments. Test samples baked 4 minutes at 160°C before testing. All test samples were immersed in the test fluids for 10 minutes. Samples were rubbed 10 times with cotton swab saturated with the test fluid.

Rating Scale:

- 1=no visible effect
- 2=slight smear or print removal, detectable but minimal smear
- 3=moderate smear or print removal (print still legible)
- 4=severe smear or print removal (print illegible or just barely legible)
- 5=complete print removal

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Performance Properties

PERFORMANCE PROPERTIES		CHEMICAL RESISTANCE
Solvent Resistance		MIL-STD202G, Method 215K
TEST FLUID		RESULTS TTRR-D
Solvent A 1 part IPA, 3 parts mineral spirits		Meets Requirement
Solvent B Terpene Defluxer		Meets Requirement
Solvent C Saponifier @ 70C		Meets Requirement

Test samples were printed with TTRR-B thermal transfer ribbon. Labels were printed with alphanumerics and barcodes. Test samples were subjected to 3 cycles of 3 minute immersions immediately followed by a toothbrush rub after each immersion.

Product testing, customer feedback and history of similar products support a customer performance expectation of at least two years from the date of receipt for this product as long as this product is stored in its original packaging in an environment between 45-90°F (7-32°C) and 20-75% RH. We are confident that our product will perform well beyond this time frame however it remains the responsibility of the user to assess the risk of using such product. We encourage customers to develop functional testing protocols that will qualify a product's fitness for use in their actual applications.

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