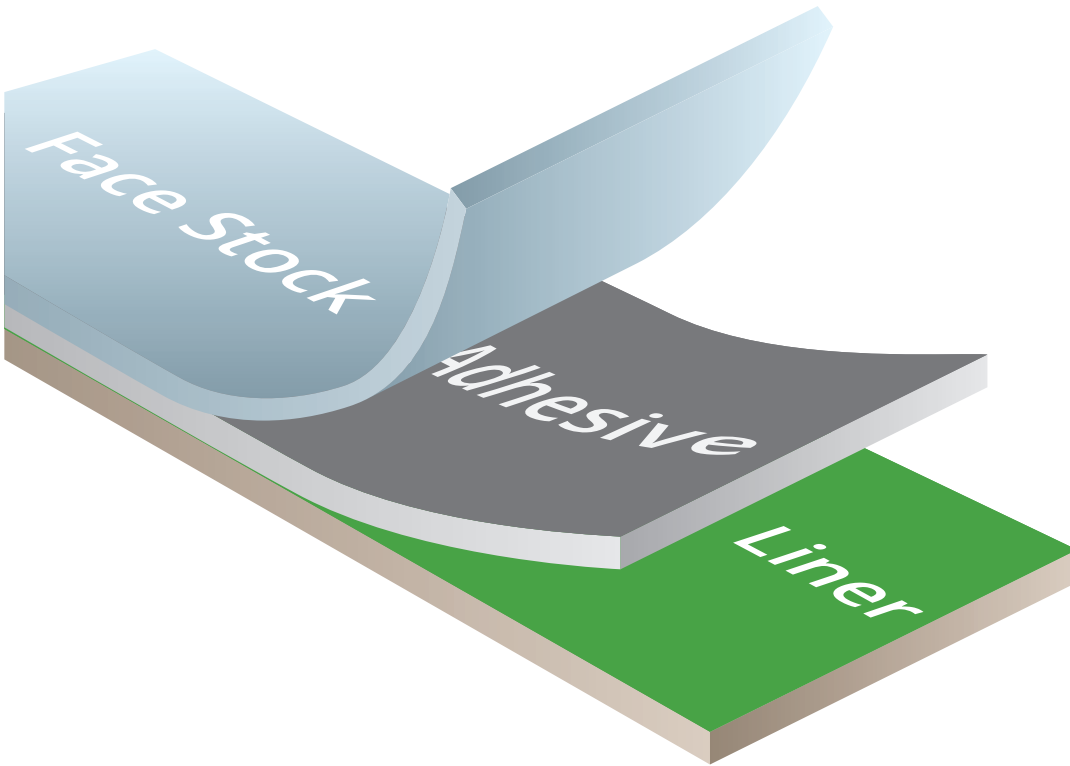


TT411



Labels for Life.



Face Stock: 2.7 mil topcoated amber (matte tan) polyimide film offering excellent chemical & high heat resistance. The material is designed to not shrink or smear from the high temperature exposure of lead free solder processes. Must be printed with TTRR-AK ribbon.

Adhesive: 2.0 mil high performance permanent acrylic pressure sensitive adhesive offering exceptional resistance to harsh PCB cleaning solvents and high heat.

Release Liner: 55# glassine liner or a 1.5 mil polyester liner designed to offer excellent performance for both manual and automatic application.

Thermal Transfer Matte Tan Polyimide Film

TT411 is designed for thermal transfer printing of variable information for circuit board & electronic component labeling. This high performance material withstands multiple passes through inline and batch cleaning processes; as well as very good resistance to most fluxes. TT411 performs well through most lead and lead-free reflow processes. Amber color is a requirement for many military applications.

Typical Applications

Electronic components marking
Top and Bottom sides of circuit boards

Typical Industry Sectors

Military
Electronics










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TT411

Thermal Transfer Matte Tan Polyimide Film



Labels for Life.

	Agency Recognitions UL-MH16873/MH16225		
	Adhesion 20 minute dwell 24 hour dwell	Epoxy PC oard 35 oz/in 39 N/m 24.8 oz/in 570 N/m	Stainless Steel 20 minute dwell 35 oz/in 39 N/m 24 hour dwell 38 oz/in 42 N/m
	Material Caliper See following charts for specific details.		
	Exterior Durability Recommended indoor use only		
	Temperature Range See following charts for specific Temperature Ranges.		
	Shelf Life Recommended Storage: 45-90 °F (7-32 °C) 20-75% R.H. Shelf Life: 2 years @ recommended storage		
	Recommended Ribbons TTRR-AK		

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TT411

Thermal Transfer Matte Tan Polyimide Film



Labels for Life.

Product Details

PHYSICAL PROPERTIES	TEST METHODS	AVERAGE RESULTS
Thickness	ASTM D 1000 Substrate (Topcoat & Film) Adhesive Liner (Glassine) Total	0.0027" (0.0690 mm) 0.0020" (0.051 mm) 0.0031/0.0015" 0.0078/0.0044"
Adhesion to: Stainless Steel Expo PC Board	ASTM D 1000 20 minute dwell 24 hours dwell 20 minute dwell 24 hours dwell	35 oz/in (39 N/100mm) 40oz/in (44 N/100mm) 37 oz/in (41 N/100mm) 39 oz/in (43 N/100)
Tack	ASTM 2979 Polyken Probe Tack	11 oz (310 g)
Drop Shear	PSTC-7 (1/2" x 1" sample)	100 hours
Dielectric Strength	ASTM D1000	10,000 volts

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 TT411 printed with IDENTCO Series TTRR-AK thermal transfer ribbon. Printed samples of TT411 were laminated to aluminum and allowed to dwell 24 hours before exposure to the indicated environmental conditions. * TT411 is not recommended for outdoor use.

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TT411

Thermal Transfer Matte Tan Polyimide Film



Labels for Life.

Performance Properties

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

Samples printed with TTRR-B, TTRR-CR, & TTRR-D 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

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

Test samples were printed with TTRR-D thermal transfer ribbon. Labels were printed with alphanumeric 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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