

Technical Data Sheet**Thermal Transfer Printable Polyimide Film**

This specification is intended to outline the physical and chemical properties of *PANDUIT*'s pressure sensitive polyimide material and include the following part numbers and printable material identifiers:

Part Number Prefixes	
TTC*KW	
TTC*K	

Printable Material Suffixes	
KBT	
KCT	

PRODUCT SPECIFICATIONS:

Description:	Material is a top coated polyimide film with a pressure sensitive adhesive. This product is halogen free and RoHS compliant (European Union directive 2002/95/EC).
Use:	Designed for barcode or alphanumeric identification of printed circuit boards, or related electronic components. It is the ideal label to withstand surface mount board processes, on either the top or bottom side of the board.
Properties:	The topcoat, in combination with Panduit thermal transfer resin ribbon, passes the requirements of MIL-STD-202G, Notice 12, Method 215K. The print resists smearing, even when the board and label are directly removed from a reflow or wave solder environment. Preheating the labeled product can further enhance print permanence in the case of extreme solvent and/or abrasion exposure, although this is not typically required for board processing applications.
Print Methods:	This material is recommended for thermal transfer printing.
Recommended Ribbons:	RMER4BL-C (for opaque white film), RMEH4BL (for opaque tan film)
Adhesive:	Acrylic based, pressure sensitive adhesive
Standard Colors:	Opaque white, Opaque tan
Thickness:	4.5 +/- 0.5 mils (coated substrate and adhesive)
Service Temperature Range:	-40°F to 350°F (-40°C to 177°C)
Minimum Application Temperature:	50°F (10°C)
Storage Conditions:	Store at 70°F (21°C) and 50% Relative Humidity.

PROPERTIES:**PERFORMANCE:**

Peel Adhesion to Stainless Steel:	35 oz/in width minimum (PSTC-101, 20 min. dwell)
Shear Adhesion:	24 hours minimum(PSTC-107, procedure A)
Tensile Strength:	MD: 45 +/- 10% lbs./inch width (PSTC-131) TD: 40 +/- 10% lbs./inch width (PSTC-131)
Elongation:	MD and TD: 65% +/- 15% (PSTC-131)
Long Term High Service Temperature:	1000 hours at 212°F (100°C), no change observed
Low Service Temperature:	1000 hours at -94°F (-70°C), no change observed
Humidity Resistance:	1000 hours at 100°F(37°C), 95% R.H., no change observed
Abrasion Resistance:	Taber Abraser, CS-10 wheels, 250 g/arm, 30 cycles, no change observed
Maximum Intermittent Temperature:	Opaque white: 482°F (250°C)/> 30 min., 527°F (275°C)/> 20 min., 572°F (300°C)/> 10 min, 617°F (325°C)/5 min. Opaque tan: 482°F (250°C)/ 5 min., 527°F (275°C)/ 1 min., 572°F (300°C)/ 1 min,

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617°F (325°C)/ 1 min.

UV Resistance:

*3000 hours in Xenon Arc Weatherometer, no change observed (ASTM G154)

***3000 hrs. equates to 5 yrs. of assimilated outdoor UV exposure.**

I. 2 mil White Thermal Transfer Printable Polyimide

Heat/Chemical Resistance

Labels printed with 3:1 ratio barcodes with 6 mil (0.152mm) X dimension bars. Samples exposed to indicated environments.

Test Environment	RMER4BL		RMER4BL-C		RMEH4BL	
	Rating before exposure ¹	Rating after exposure ¹	Rating before exposure ¹	Rating after exposure ¹	Rating before exposure ¹	Rating after exposure ¹
Control	B	B	A	A	A	A
260C heat, 5 minutes	B	B	A	A	A	A
170C heat, 2 hours	A	A	A	A	A	A
Kyzen Corp, Aquanox SSA, 30% aqueous, 40-45C, 10 minutes ²	B	B	A	A	A	A
RE-ENTRY.KNI 2000 Terpene, 40-45C, 10 minutes ²	B	C	A	C	A	NR
Alpha Metals Inc. 2110 Saponifier, 6% aqueous, 65-70C, 10 minutes ²	A	C	A	NR	A	B
Isopropanol 99%, 82C, 10 minutes	A	B	A	A	A	NR
Deionized water, 100C, 10 minutes	A	A	A	A	A	A
1,1,1 Trichloroethane, 74C, 10 minutes	A	A	A	A	A	NR
BIOACT EC-7R Terpene Cleaner, 40-45C, 10 minutes ²	A	B	A	A	A	NR
Acetone, 30C, 10 minutes	A	F	A	NR	A	NR

¹ Rating determined using PSC QuickCheck 850 Scanner.

² Followed by 2 minute immersion in deionized water at 100C.

NR – NOT RATED

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PROPERTIES

Chemical Resistance

TEST METHOD

MIL-STD-202G, Notice 12, Method 215K

Labels printed with alphanumerics and 3:1 ratio barcodes with 6 mil (0.152mm) X dimension bars. Samples subjected to 3 cycles of three minute immersions immediately followed by a toothbrush rub after each immersion.

TEST FLUID	RMER4BL	RMER4BL-C	RMEH4BL
Solvent A 1 part IPA, 3 parts Mineral Spirits	Loss of print legibility	Loss of print density	Loss of print legibility
Solvent B 1,1,1 Trichloroethane	Solvent deleted per Notice 12	Solvent deleted per Notice 12	Solvent deleted per Notice 12
Solvent C Terpene Defluxer	No visible effect	Loss of print legibility	No visible effect
Solvent D Saponifier	No visible effect	No visible effect	Loss of print density

Aquanox SSA™ is a trademark of Kyzen Corporation. EC-7R™ is a trademark of Petroferm Inc. RE-ENTRY™ is a registered trademark of Environsolv Inc.

References: ASTM: American Society for Testing and Materials (U.S.A.) PSTC: Pressure Sensitive Tape Council (U.S.A.) S1: International Systems of Units.

II. 2 mil Tan Thermal Transfer Printable Polyimide

Heat/Chemical Resistance

Labels printed with 3:1 ratio barcodes with 6 mil (0.152mm) X dimension bars. Samples exposed to indicated environments.

Test Environment	RMER4BL		RMER4BL-C		RMEH4BL	
	Rating before exposure ¹	Rating after exposure ¹	Rating before exposure ¹	Rating after exposure ¹	Rating before exposure ¹	Rating after exposure ¹
Control	D	D	A	A	A	A
260C heat, 5 minutes	C	C	A	A	A	A
170C heat, 2 hours	D	D	A	A	A	A
Kyzen Corp, Aquanox SSA, 30% aqueous, 40-45C, 10 minutes ²	D	D	A	A	A	A
RE-ENTRY.KNI 2000 Terpene, 40-45C, 10 minutes ²	D	D	A	A	A	A
Alpha Metals Inc. 2110 Saponifier, 6% aqueous, 65-70C, 10 minutes ²	D	D	A	A	A	A
Isopropanol 99%, 82C, 10 minutes	C	C	A	A	A	A
Deionized water, 100C, 10 minutes	C	C	A	A	A	A
1,1,1 Trichloroethane, 74C, 10 minutes	C	C	A	A	A	A

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Test Environment	RMER4BL		RMER4BL-C		RMEH4BL	
BIOACT EC-7R Terpene Cleaner, 40-45C, 10 minutes ²	C	C	A	A	A	A
Acetone, 30C, 10 minutes	D	D	A	A	A	A

¹ Rating determined using PSC QuickCheck 850 Scanner.

² Followed by 2 minute immersion in deionized water at 100C.

PROPERTIES

Chemical Resistance

TEST METHOD

MIL-STD-202G, Notice 12, Method 215K

Labels printed with alphanumerics and 3:1 ratio barcodes with 6 mil (0.152mm) X dimension bars. Samples subjected to 3 cycles of three minute immersions immediately followed by a toothbrush rub after each immersion.

TEST FLUID	RMER4BL	RMER4BL-C	RMEH4BL
Solvent A 1 part IPA, 3 parts Mineral Spirits	No visible effect	No visible effect	No visible effect
Solvent B 1,1,1 Trichloroethane	Solvent deleted per Notice 12	Solvent deleted per Notice 12	Solvent deleted per Notice 12
Solvent C Terpene Defluxer	No visible effect	Loss in print density	No visible effect
Solvent D Saponifier	No visible effect	No visible effect	No visible effect

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APPROVALS

UL Recognized: UL 969

File Number: MH 14979

CUL Recognized: C22.2 No. 0.15-01

File Number: MH 14979

LIMITED WARRANTY

All PANDUIT Identification Solution Products (except for Software programs) are warranted to be free from defects in material and workmanship at the time of sale but our obligation under this warranty is limited to replacement of the product proved to be defective within 6 months from the date of sale, or in the case of printers, within 90 days from the date of sale. This warranty is void if the products or printers are modified, altered or misused in any way. Use of PANDUIT printers with any product other than the specified PANDUIT products for which the printer was designed constitutes misuse. Before using, the user shall determine the suitability of the product for its intended use and user assumes all risk and liability whatsoever in connection therewith. The foregoing may not be altered except by an agreement signed by officers of seller and manufacturer.

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