Thermal Transfer Polyimide Label Material
7812

Technical Data **September 2017**

Product Description

3M™ Thermal Transfer Polyimide Label Material 7812 is a polyimide film product that offers ultra-high temperature performance. This label product utilizes 3M™ Adhesive 100, that can withstand up to 450°F (232°C) short-term heat resistance, has excellent solvent resistance, and exhibits low outgassing characteristics.

Construction

(Calipers are nominal values.)

Facestock	Adhesive	Liner
2.0 mils (51 microns) Polyimide Film 1.1 mil (25 microns) Matte White Kraft Thermal Transfer Printable Topcoat	2.0 mil (51 microns) 100 Acrylic	3.2 mils (76 microns) 50# Densified

Features

- Matte white thermal transfer topcoat for easy readability of barcodes and variable information.
- Adhesive will not degrade when exposed to a wide variety of harsh processing conditions. This adhesive also offers exceptional shear strength even at elevated temperatures.
- 50# densified kraft liner assures consistent die cutting.
- UL Recognized and CSA Accepted. See UL (File MH16411) and CSA (File 99316) listings for details.

Application Ideas

- Printed circuit board tracking labels that see the following conditions:
  - Solder reflow;
  - Top and/or bottom side wave solder;
  - Most cleaning processes and chemicals.
- Labeling on parts exposed to high temperatures.

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Typical Peel Adhesion Properties

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Adhesion: 180° peel test procedure is ASTM D 3330.

	Initial (10 Minute Dwell/RT)		Conditioned for 3 Days at Room Temperature 72°F (22°C)	
	180° Peel		180° Peel	
Surface	Oz./In.	N/100 mm	Oz./In.	N/100 mm
Stainless Steel	32	35	53	58
Polycarbonate	34	37	58	63
Epoxy PC Board	44	48	62	68

	Conditioned for 3 Days at 120°F (49°C)		Conditioned for 24 Hours at 90°F (32°C) at 90% relative humidity	
	180° Peel		180° Peel	
Surface	Oz./In.	N/100 mm	Oz./In.	N/100 mm
Stainless Steel	66	72	64	70
Polycarbonate	56	61	62	68
Epoxy PC Board	67	73	44	48

Environmental Performance

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

The properties defined are based on four hour immersions at room temperature (72°F/22°C) unless otherwise noted. Samples were applied to stainless steel panels 24 hours prior to immersion and were evaluated one hour after removal from the solution for peel adhesion. Adhesion measured at 180° peel angle (ASTM D 3330) at 12 inches/minute.

Chemical Resistance:

	Adhesion to Stainless Steel		Appearance	Edge Penetration
Chemical	Oz./in.	N/100 mm	Visual	Millimeters
Isopropyl Alcohol	47	51	No change	0
Detergent 1% Alconox® Cleaner	53	58	No change	0
Engine Oil (10W30) @ 250°F (121°C)	96	105	No change	0
Water for 48 hours	54	59	No change	0
pH 4	53	58	No change	0
pH 10	50	55	No change	0
409® Formula	51	56	No change	0
Toluene	25	27	No change	0
Acetone	13	14	No change	0
Brake Fluid	53	58	No change	2
Gasoline	39	43	No change	1
Diesel Fuel	49	54	No change	0
Mineral Spirits	47	51	No change	0
Hydraulic Fluid	49	54	No change	0

Temperature Resistance:

530°F (277°C) for 30 seconds:	no significant visual change
500°F (260°C) for 7 minutes:	slight browning
-40°F (-40°C) for 24 hours:	no significant visual change

Humidity Resistance:

24 hours at 100°F (38°C) and 100% relative humidity:	no significant change in appearance or adhesion

Accelerated Aging:

ASTM D 3611:	96 hours at 150°F (65°C) and 80% relative humidity

Application Techniques

For maximum bond strength, the surface should be clean and dry. Typical cleaning solvents are heptane and isopropyl alcohol.*

For best bonding conditions, application surface should be at room temperature or higher. Low temperature surfaces, below 50°F (10°C), can cause the adhesive to become so firm that it will not develop maximum contact with the substrate. Higher initial bonds can be achieved through increased rubdown pressure.

- When using solvents, read and follow the manufacturer's precautions and directions for use.

3M™ Thermal Transfer Polyimide Label Material 7812

Printing

Facestock is topcoated and is designed for thermal transfer printing.

- Recommended Ribbons
  Ricoh; D110A
  Union Chemicar; US300

  The following ribbons can be used but may require higher burn temperatures:
  Sony; 5070
  Mid City Columbia; CGL-80HE Dai
  Nippon; R510

Printed Label Performance:
Samples were printed with a Ricoh D110A resin ribbon on Zebra 170xi printer at a rate of 2 in./min. and a burn setting of 22. Labels were printed with a 3:1 ratio barcode with 6 mil X-dimension. Printed labels were exposed to the listed conditions, which are representative of PCB assembly conditions. After chemical exposure, labels were rinsed with tap water, dried and examined.

Condition	Printed Contrast Signal (PCS)	Read Rate
3M™ Label Material 7812 Control	97	100
530°F, 30 sec.	97	100
500°F, 7 min.	94	100
IPA 75%, 106°F, 15 min.	97	100
IPA 100%, RT 2 min.	97	100
Deionized Water, 140°F, 5 min.	97	100
Alconox® 10%, 135°F, 2 min.	97	100
D-Limonene RT, 2 min.	97	100
Monoethanolamine, 135°F, 2 min.	97	100
BIOACT® EC-7R, 77°F, 10 min.	92	100
BIOACT® EC-15, 77°F, 10 min.	92	100
Wave Solder	95	100

The Print Contrast Signal, PCS, was determined using a PSC QUICKCHECK™ 850, with a 0.003" aperture, 660 nm wavelength. The read rate was determined using a PSC laser diode scanner, model 4100. Wave soldering was performed on an Electrovert Co., Microline 250 wave solder machine. Preheat temperature was 250°F (121°C), solder temperature was 470°F (243°C), line speed was 2 ft./min. Boards were pre-sprayed with a Kester Solder Co. 923 flux.

Convertability

The exceptional shear strength of 3M™ Acrylic Adhesive 100 is an excellent choice for high temperature applications such as printed circuit boards. Specifically designed to be compatible with thermal transfer technologies. Adhesive processing issues are not anticipated when proper roll tensions, handling and storage conditions are used. Please refer to the die cutting section of this data page or the “Guide to Converting and Handling Label Products” technical bulletin for additional information.

3M™ Thermal Transfer Polyimide Label Material 7812

Die-Cutting	Rotary die-cutting is recommended.
Packaging	Finished labels should be stored in plastic bags.
Storage	Store at room temperature conditions of 72°F (22°C) and 50% relative humidity.
Shelf Life	If stored under proper conditions, product retains its performance and properties for two years from date of manufacture.
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ISO 9001

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.

3M

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