

**Technical Data Sheet**  
**TDS No. B-457**  
**Effective Date: 12/13/1999**



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**BRADY B-457 THERMAL TRANSFER PRINTABLE WHITE POLYIMIDE LABEL STOCK**

**Description:**

Brady B-457 is a polyimide film with a permanent pressure sensitive acrylic adhesive and a high opacity, gloss white topcoat specifically designed for **thermal** transfer printing.

Brady B-457 is designed for barcode or alphanumeric identification of printed circuit boards, or related electronic components. It is the ideal label to withstand mixed board processes, on either the top or bottom side of the board. It has excellent resistance to harsh fluxing and wave solder environments, and resists all commonly employed methods of cleaning.

The B-457 topcoat, in combination with the Series R6000 ribbon, passes the requirements of MIL-STD-202F, Notice 12, Method 215J. The print resists smearing, even when the board and label are directly removed from a reflow or wave solder environment. Preheat can be employed to further enhance print permanence in the case of extreme solvent and/or abrasion exposure, although this is not typically required for board processing applications.

Required ribbon is the Brady Series R6000.

Suggested Brady printers are models THT 203-S and THT 300-S, X and X Plus Series, THT4042, TLS2200™ Thermal Labeling System, or any Brady Printer Applicator Machine (PAM).

Brady B-457 is UL recognized to UL969 Labeling and Marking Standard when printed with the Brady Series R6000 ribbon. See UL file MH17154 for specific details.

**Details:**

PHYSICAL PROPERTIES	TEST METHODS	AVERAGE RESULTS
Thickness	ASTM D 1000 -Substrate -Adhesive -Total	0.0027 inch (0.068 mm) 0.0017 inch (0.043 mm) 0.0044 inch (0.111 mm)
Adhesion to: -Stainless Steel  -Epoxy PC Board	ASTM D 1000 20 minute dwell 24 hour dwell  20 minute dwell 24 hour dwell	38 oz/in (42 N/100 mm) 50 oz/in (55 N/100 mm)  29 oz/in (32 N/100 mm) 39 oz/in (43 N/100 mm)
Tack	ASTM D 2979 Polyken™ Probe Tack 1 second dwell	37 oz (1030 g)
Drop Shear	PSTC-7 (except use 1/2" x 1" sample)	>100 hours
Dielectric Strength	ASTM D 1000	9500 volts

Performance properties tested on B-457 printed with Series R6000 ribbon using a BradyPrinter™ THT Model 300X thermal transfer printer at a burn temperature of 28. Printed samples of B-457 were laminated to aluminum and allowed to dwell 24 hours before exposure to the indicated environmental conditions.

PERFORMANCE PROPERTIES	TEST METHODS	TYPICAL RESULTS
Short Term High Service Temperature	5 minutes at 500°F (260°C)	No visible effect to label at 260°C, label discolors slightly at 270°C, at 300°C label moderately discolors and adhesive discolors at label edge. Label remains functional.
	2 hours at 338°F (170°C)	No visible effect to label at 170°C, label discolors slightly at 190°C, moderately at 220°C, and severely at 260°C. Label remains functional.
Long Term High Service Temperature	1000 hours at 212°F (100°C)	No visible effect to label at 100°C, label discolors slightly at 120°C, moderately at 145°C. Label remains functional.
Low Service Temperature	1000 hours at -94°F (-70°C)	No visible effect
Humidity Resistance	1000 hours at 100°F (37°C), 95% R.H.	No visible effect
UV Light Resistance	1000 hours in UV Sunlighter™ 100	Topcoat turns light yellow, label remains functional
Weatherability*	ASTM G 26 1000 hours in Xenon Arc Weatherometer	No visible effect
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)	R6000: Print legible to 350 cycles
Vapor Phase Resistance	Label adhered to epoxy PC board and exposed to: 2 minutes in Fluorinert™ FC-5312 vapor phase at 420°F (216°C)	No visible effect without rub, moderate to total print smear with rub

\*B-457 is not recommended for outdoor use.

PERFORMANCE PROPERTY	HEAT/CHEMICAL/ABRASION RESISTANCE
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Samples printed with Series R6000 **thermal** transfer ribbon using a BradyPrinter™ THT 300X at a burn temperature of 28. Labels printed with 3:1 ratio barcodes with 6 mil X dimension bars. Samples exposed to indicated environments. Abrasion Performance tested with 100 strokes of stainless steel ball (AISI 302, 0.3125" diameter) with 300 gram load.

TEST ENVIRONMENT	PCS <sup>1</sup>	READ RATE <sup>2</sup>	PCS AFTER ABRASION	READ RATE AFTER ABRASION
Control	99%	100%	99%	100%
260°C heat - 5 minutes	99%	100%	99%	100%
1,1,1-Trichloroethane, 74°C - 10 minutes	99%	100%	98%	100%
Kyzen Corp. Aquanox SSA™ 30% aqueous, 40-45°C - 10 minutes <sup>3</sup>	99%	100%	99%	100%
RE-ENTRY® KNI 2000 Terpene, 40-45°C - 10 minutes <sup>3</sup>	99%	100%	99%	100%
BIOACT® EC-7R™ Terpene Cleaner, 40-45°C - 10 minutes <sup>3</sup>	98%	100%	98%	100%
Alpha Metals Inc. 2110 Saponifier 6% aqueous, 65-70°C - 10 minutes <sup>3</sup>	98%	100%	98%	100%
Isopropyl Alcohol 99%, 82°C - 10 minutes	99%	100%	99%	100%
Deionized Water, 100°C - 10 minutes	99%	100%	99%	100%

<sup>1</sup>PCS-Print Contrast Signal. PCS determined with Quick Check 500B, 0.005" aperture, 660nm wavelength. Quick Check 500B manufactured by Photographic Sciences Corp.

<sup>2</sup>Read rate determined using an Intermec® 1621 laser scanner.

<sup>3</sup>Followed by 2 minute immersion in deionized water at 100°C.

PERFORMANCE PROPERTY	TEST METHOD
Chemical Resistance	MIL-STD-202F, Notice 12, Method 215J

Samples printed with Series R6000 **thermal** transfer ribbon using BradyPrinter™ THT 300-X at a burn temperature of 28. Labels printed with alphanumerics and 3:1 ratio barcodes with 6 mil X dimension bars. Samples subjected to 3 cycles of 3 minute immersions immediately followed by a toothbrush rub after each immersion.

TEST FLUID	TYPICAL RESULTS
Solvent A 1 part IPA, 3 parts Mineral Spirits	No visible effect
Solvent B 1,1,1-Trichloroethane	Solvent deleted per Notice 12
Solvent C Terpene Defluxer	No visible effect
Solvent D Saponifier	No visible effect

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 *below 80 degrees F and 60% 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.

**Trademarks and References:** Aquanox SSATM is a trademark of Kyzen Corporation.

BIOACT® is a registered trademark of Petroferm, Inc.

BradyPrinter™ is a trademark of Brady Worldwide, Inc.

EC-7R™ is a trademark of Petroferm Inc.

Fluorinert™ is a trademark of the 3M Corporation.

Intermec® is a registered trademark of the Intermec Corporation.

Polyken™ is a trademark of Testing Machines Inc.

RE-ENTRY® is a registered trademark of Environsolv Inc.

Sunlighter™ is a trademark of the Test Lab Apparatus Company

TLS2200™ is a trademark of Brady Worldwide, Inc.

AISI: American Iron and Steel Institute (U.S.A.)

ASTM: American Society for Testing and Materials (U.S.A.)

PSTC: Pressure Sensitive Tape Council (U.S.A.)

UL: Underwriters Laboratories Inc. (U.S.A.)

All S.I. Units (metric) are mathematically derived from the U.S. Conventional Units.

#### Preliminary Technical Data

The information in this Technical Data Sheet is based on the evaluation of limited production quantities of the product and may be modified by BRADY WORLDWIDE, INC. following additional production experience and testing. This product is not yet standard and, therefore, may be subject to modification, product limitations or cancellation.

Note: All values shown are averages and should not be used for specification purposes.

Test data and test results contained in this document are for general information only and shall not be relied upon by Brady customers for designs and specifications, or be relied on as meeting specified performance criteria. Customers desiring to develop specifications or performance criteria for specific product applications should contact Brady for further information.

#### WARRANTY

Brady products are sold with the understanding that the buyers will test them in actual use and determine for themselves their adaptability to their intended uses. Brady warrants to the buyers that its products are free from defects in material and workmanship, but limits its obligation under this warranty to replacement of the product shown to Brady's satisfaction to have been defective at the time Brady sold it. This warranty does not extend to any persons obtaining the product from the buyers. **This warranty is in lieu of any other warranty, express or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose, and of any other obligations or liability on Brady's part. Under no circumstances will Brady be liable for any loss, damage, expense, or consequential damages of any kind arising in connection with the use, or inability to use, Brady's products.**

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