Technical Data Sheet TDS No. B-473 Effective Date: 10/11/2000



Description:

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BRADY B-473 THERMAL TRANSFER PRINTABLE STATIC DISSIPATIVE LABELS

B-473 is a glossy white polyester film with a static dissipative permanent pressure sensitive adhesive and a topcoat specifically formulated for **thermal** transfer printing.

B-473 is designed for applications where static charge is critical, such as topside of printed circuit boards and rating plates that utilize high quality/density alphanumerics, barcodes and graphics.

B-473 is static dissipative and can be used without fear of static charge. It has surface resistivity values in the static dissipative range between 10^6 and 10^{12} ohms/sq.

B-473 meets the requirement of EIA-541 "Packaging Material Standards for ESD Sensitive Items," in which a charged material must decay to 1% of its initial voltage in less than 2 seconds. B-473 is a UL Recognized component when printed with Brady R6000 or R4900 ribbons. B-473 is a CSA Accepted material when printed with Brady R6000 ribbon. See UL File MH17154 and CSA Acceptance Record LS 41833 for specific details.

B-473 is also available web cleaned and packaged for introduction into ISO Class 5 cleanroom applications. This cleanroom product is supplied on a film release liner for standard benchtop **thermal** transfer printers (THT) and Brady's TLS2200® printer family (PTL). The change to the film release liner may affect some adhesive performance characteristics noted in this Technical Data Sheet. However, short term test studies showed the impact on adhesive performance to be minimal.

Details:

PHYSICAL PROPERTIES	TEST METHODS	AVERAGE RESULTS
Thickness	ASTM D 1000 -Substrate -Adhesive -Total	0.0020 inch (0.05 mm) 0.0014 inch (0.04 mm) 0.0034 inch (0.09 mm)
Adhesion to: - Stainless Steel	ASTM D 1000 20 minute dwell 24 hour dwell	49 oz/inch (54 N/100 mm) 60 oz/inch (66 N/100 mm)
Tack	ASTM D 2979 Polyken™ Probe Tack (1 second dwell, 1 cm/sec separation)	31 oz (885 g)
Drop Shear	PSTC-7 (except use 1/2" x 1" sample)	70 hours
Tensile Strength and Elongation	ASTM D 1000 -Machine -Cross	38 lbs/inch (665N/100 mm), 68% 56 lbs/inch (980N/100 mm), 46%
Dielectric Strength	ASTM D 1000	9000 volts

ELECTRICAL PROPERTIES	TEST METHODS	AVERAGE RESULTS
Surface Resistivity	EOS/ESD S11.11 -adhesive	5 x 10 ⁸ ohms/sq.
Static Decay	EIA-541 to 1% of initial charge	0.01 seconds
Voltage (Label removed from liner)	Value is obtained by removing a 1.5" x 0.25" label from liner and immediately holding label to a static sensing device calibrated in volts.	10 volts

The following testing was performed with B-**473 thermal** transfer printed on a BradyPrinter[™] THT 300X using a Brady Series R6000 ribbon. Labels printed with 3:1 ratio barcodes with 6 mil X dimension bars and alphanumerics. Samples laminated to aluminum panels and allowed to dwell 24 hours prior to testing.

PERFORMANCE PROPERTIES	TEST METHOD	TYPICAL RESULTS	
Short Term High Service Temperature	5 minutes at 354°F (180°C)	No visible effect to label at 180°C. Slight film shrinkage at 190°C but label is still functional. At 210°C label has severe film shrinkage.	
Long Term High Service Temperature	30 days at 248°F (120°C)	No visible effect at 120°C	
Low Service Temperature	30 days at -40°F (-40°C)	No visible effect at -40°C	
Humidity Resistance	30 days at 100°F (37°C) and 95% R.H.	No visible effect	
UV Light Resistance	30 days in UV Sunlighter™ 100	No visible effect	
Weatherability ¹	ASTM G 26 30 days in Xenon Arc Weatherometer	No visible effect	
Salt Fog Resistance	ASTM B 117 30 days in 5% salt fog solution chamber	No visible effect	

	PERFORMANCE PROPERTY	CHEMICAL RESISTANCE
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Samples printed with Series R4900 and R6000 ribbons using a BradyPrinter[™] Model 300X. Labels printed with 3:1 ratio barcodes with 6 mil narrow X dimension bars and alphanumerics. Test was conducted at room temperature after 24 hour dwell. Testing consisted of 5 cycles of 10 minute immersions in the specified chemicals followed by a 30 minute recovery period. Samples rubbed 10 times with cotton swab immersed in test fluid after final immersion.

CHEMICAL	SUBJECTIVE OBSERVATION OF VISUAL CHANGE			
REAGENT	LABEL STOCK	R4900	R6000	EFFECT OF COTTON SWAB RUBS
Methyl Ethyl Ketone	Slight adhesive ooze	No visible effect	No visible effect	Printing removed
1,1,1-Trichloroethane	Slight adhesive ooze	No visible effect	No visible effect	Printing removed
Toluene	Slight adhesive ooze	No visible effect	No visible effect	Printing removed
Freon® TMS	Slight adhesive ooze	No visible effect	No visible effect	No visible effect
Isopropyl Alcohol	No visible effect	No visible effect	No visible effect	No visible effect
Mineral Spirits	No visible effect	No visible effect	No visible effect	No visible effect
JP-4 Jet Fuel	No visible effect	No visible effect	No visible effect	No visible effect
Mil 5606 Oil	No visible effect	No visible effect	No visible effect	No visible effect
ASTM #3 Oil	No visible effect	No visible effect	No visible effect	No visible effect
Gasoline	Slight adhesive ooze	No visible effect	No visible effect	No visible effect
Skydrol® 500B-4	Slight adhesive ooze	No visible effect	No visible effect	Printing removed
Super Agitene®	No visible effect	No visible effect	No visible effect	No visible effect
Alphametals BIOACT® EC-7R™	Slight adhesive ooze	No visible effect	No visible effect	No visible effect
Deionized Water	No visible effect	No visible effect	No visible effect	No visible effect
3% Alconox® Detergent	No visible effect	No visible effect	No visible effect	No visible effect
10% Sodium Hydroxide Solution	No visible effect	No visible effect	No visible effect	No visible effect
10% Sulfuric Acid Solution	No visible effect	No visible effect	No visible effect	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: Alconox® is a registered trademark of Alconox Co. BIOACT® is a registered trademark of Petroferm, Inc. BradyPrinter™ is a trademark of Brady Worldwide, Inc. EC-7R™ is a trademark of Petroferm Inc. Freon® is a registered trademark of Du Pont de Nemours, E.I. and Company. Polyken™ is a trademark of Testing Machines Inc. Skydrol® is a registered trademark of the Monsanto Company Sunlighter™ is a trademark of the Test Lab Apparatus Company Super Agitene® is a registered trademark of Brady Worldwide, Inc.

ASTM: American Society for Testing and Materials (U.S.A.) EIA: Electronic Industry Association (U.S.A.) EOS/ESD: Electrical Overstress/Electrostatic Discharge (U.S.A.) PSTC: Pressure Sensitive Tape Council (U.S.A.)

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

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.

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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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