

BRADY B-421 MATTE BLACK LASER MARKABLE POLYESTER LABEL STOCK

TDS No B-421

Effective Date: July 15, 2017

Description:

GENERAL

Print Technology: Laser Markable

Material Type: Topcoated 2.0 mil polyester film

Finish: Matte Black

Adhesive: Permanent Acrylic

APPLICATIONS

B-421 is designed for use in labeling electronic PCB's, component identification, bar coding, and rating plates when marked with a standard IR laser. The product can be used for auto-dispensing applications and can meet small font requirements when used with a high resolution laser marking system.

RECOMMENDED LASER SPECIFICATIONS

IR Laser systems operating at 10 W or greater are recommended for this product when operating at near to mid IR regions. Typical systems are classified as Class IV lasers and include 980 nm diode lasers, Nd:YAG lasers at 1064 nm, and CO₂ lasers operating between 9.6 and 10.6 μm. These systems will all produce strong contrasting marks when using appropriate power and writing speeds.

AGENCY APPROVAL

Brady B-421 is UL Recognized to UL969 Labeling and Marking Standard when marked with an IR Laser. See UL file MH17154 for specific details.

Details:

PHYSICAL PROPERTIES	TEST METHODS	TYPICAL RESULTS
Thickness	ASTM D1000 -Substrate (topcoated film) -Adhesive -Total (excluding liner)	0.0027 inch (0.069 mm) 0.0010 inch (0.025 mm) 0.0037 inch (0.094 mm)
Adhesion to:	ASTM D1000	
-Stainless Steel	20 minute dwell 24 hour dwell	56 oz/in (61 N/100 mm) 60 oz/in (66 N/100 mm)
-Painted Enamel	20 minute dwell 24 hour dwell	54 oz/in (59 N/100 mm) 58 oz/in (63 N/100 mm)
-Textured ABS	20 minute dwell 24 hour dwell	21 oz/in (23 N/100 mm) 21 oz/in (23 N/100 mm)
-Polypropylene	20 minute dwell	36 oz/in (39 N/100 mm)

-Powder Coated Paint	24 hour dwell	36 oz/in (39 N/100 mm)
	20 minute dwell	24 oz/in (26 N/100 mm)
	24 hour dwell	24 oz/in (26 N/100 mm)
Tack	ASTM D 2979 Polyken™ Probe Tack 1 second dwell	48 oz (1350 g)
Dielectric Strength	ASTM D1000	8,400 volts

Performance properties tested on B-421 samples that were laser marked using a 10 W laser diode laser marking system. Laser marked B-421 samples 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 various temperatures	No visible effect to label or printed image at 356°F (180°C); no visible effect to label, printed image discolors slightly at 392°F (200°C); at 410°F no visible effect to label, printed image slightly discolored, slight label shrinkage, print still legible and label remains functional.
Long Term High Service Temperature	1000 hours at various temperatures	No visible effect to label or printed image at 212°F (100°C); no visible effect to label, printed image discolors slightly at 266°F (130°C); at 320°F (160°C) no visible effect to label, printed image moderately discolored, print still legible and label remains functional.
Low Service Temperature	1000 hours at -94°F (-70°C)	No visible effect to label or printed image
Humidity Resistance	1000 hours at 100°F (38°C)/95%RH	No visible effect to label or printed image
UV Light Resistance	ASTM G155, cycle 1, Dry 1000 hours in Q-Sun Xenon Test Chamber	No visible effect to label, printed image discolors slightly, print still legible and label remains functional.
Weatherability	ASTM G155, Cycle 1 1000 hours in Xenon arc Weather-Ometer®	No visible effect to label or printed image
Salt Fog Resistance	ASTM B117 1000 hours in 5% salt fog solution chamber	No visible effect to label or printed image
Abrasion Resistance	Taber Abraser, CS-10 grinding wheels, 500 g/arm (Fed. Std. 191A, Method 5306)	Printed image legible after 100 cycles

PERFORMANCE PROPERTY	CHEMICAL RESISTANCE
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B-421 samples were laser marked using a 10 W laser diode laser marking system, then laminated to aluminum panels. After 24 hr dwell, test samples were immersed in the test fluids for 30 minutes at room temperature, then rubbed 10 times with a cotton swab saturated with the test fluid.

CHEMICAL REAGENT	SUBJECTIVE OBSERVATION OF VISUAL CHANGE		
	EFFECT TO LABEL	LASER MARKED IMAGE	
		WITHOUT RUB	WITH RUB
Acetone	No visible effect	1	1
Toluene	No visible effect	1	2
Isopropyl Alcohol	No visible effect	1	1
Mineral Spirits	No visible effect	1	1
Gasoline	No visible effect	1	1
JP-8 Jet Fuel	No visible effect	1	1
Brake Fluid - DOT 3	No visible effect	1	1
Skydrol® 500B-4	No visible effect	1	1
SAE 20 WT Oil, 70°C	No visible effect	1	1
MIL 5606 Oil	No visible effect	1	1
Formula 409® Cleaner	No visible effect	1	1
Northwoods™ Buzz Saw Citrus Degreaser	No visible effect	1	1
Deionized Water	No visible effect	1	1
Skydrol® LD4	No visible effect	1	1
Kerosene	No visible effect	1	1
MIL 7808 Oil	No visible effect	1	1
Methyl Ethyl Ketone	No visible effect	1	2
Alpine RF-11	No visible effect	1	1
Cryotech Polar Guard Advance Type IV	No visible effect	1	1

Rating Scale:

1=no visible effect

2=slight removal of topcoat, label still legible

3=moderate removal of topcoat, label still legible

4=severe removal of topcoat (print illegible or just barely legible)

5=complete topcoat removal

Shelf Life:

Two years when stored in its original packaging in an environment below 80°F (27°C) and 80%RH.

Trademarks:

ANSI: American National Standards Institute (U.S.A.)

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

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

Polyken™ is a trademark of Testing Machines Inc.

Skydrol® is a registered trademark of the Monsanto Company

Formula 409® is a registered trademark of the Clorox Company

Northwoods™ is a trademark of the Superior Chemical Corporation

Weather-Ometer® is a registered trademark of Atlas Material Testing Technology LLC

UL: Underwriters Laboratories Inc. (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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