

BRADY B-421 MATTE BLACK LASER MARKABLE POLYESTER LABEL STOCK

TDS No B-421
Effective Date: 09/13/2019

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.

REGULATORY/AGENCY APPROVALS

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. UL information can be accessed on line at UL.com in the UL Product iQ area.

For information on the Weee-RoHS compliance status for a Brady Product go to one of the following websites:

In Canada: www.bradycanada.ca/weee-rohs

In Europe: www.bradyeurope.com/rohs

In Japan: www.brady.co.jp/products/labelsuse/rohs

All other regions: www.bradyid.com/weee-rohs

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 24 hour dwell | 36 oz/in (39 N/100 mm) 36 oz/in (39 N/100 mm) |

| | | |
|---------------------|---|--|
| Powder Coated Paint | 20 minute dwell 24 hour dwell | 24 oz/in (26 N/100 mm) 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 500 cycles |

| PERFORMANCE PROPERTY | CHEMICAL RESISTANCE |
|----------------------|---------------------|
|----------------------|---------------------|

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 is 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° F (27° C) and 60% RH. It remains the responsibility of the user to assess the risk of using this product. We encourage customers to develop testing protocols that will qualify a product's fitness for use in their actual application.

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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