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Technical Data Sheet

BRADY B-438 THERMAL TRANSFER PRINTABLE TAMPER EVIDENT MATTE METALLIZED POLYESTER LABEL STOCK

TDS No. B-438

Effective Date: 26/09/2006

Description:

GENERAL

Print Technology: Thermal Transfer**Material Type:** Metallized Polyester**Finish:** Matte Silver**Adhesive:** Tamper Indicating Acrylic

APPLICATION

Rating and serial plates that require high performance and evidence of label removal

RECOMMENDED RIBBONS

Brady series R4300 black and R4500 colored (red, blue, and green)

REGULATORY/AGENCY APPROVALS

UL: B-438 is UL Recognized to UL969 Labeling and Marking Standard when printed with Brady series R4300 ribbon. See UL file MH17154 for specific details. UL information can be accessed online at ul.com. Search in *Certifications* area.

Brady B-438 is RoHS compliant to 2005/618/EC MCV amendment to RoHS Directive 2002/95/EC.

SPECIAL FEATURES

B-438 is designed to leave a "CHECKERBOARD" footprint when the label is removed. In addition, a "CHECKERBOARD" pattern will appear on the top surface of the label in order to prevent it from being reused. Recommended 24 hour room temperature dwell before removal for full tamper evident performance. The adhesive nature of this product does not allow for repositioning and requires minimal handling in order to prevent prematurely exposed CHECKERBOARD pattern.

Details:

PHYSICAL PROPERTIES	TEST METHODS	AVERAGE RESULTS
Thickness	ASTM D 1000 -Substrate -Adhesive -Total	0.0025 inch (0.064 mm) 0.0008 inch (0.021 mm) 0.0033 inch (0.085 mm)
Adhesion to:	ASTM D 1000	
-Stainless Steel	30 minute dwell	22 oz/in (24 N/100 mm)
-Aluminum	30 minute dwell	28 oz/in (31 N/100 mm)
-Glass	30 minute dwell	22 oz/in (24 N/100 mm)
-Smooth ABS	30 minute dwell	54 oz/in (59 N/100 mm)
Tack	ASTM D 2979 Polyken™ Probe Tack (1 second dwell, 1 cm/sec separation)	Not applicable due to the nature of this product.
Drop Shear	PSTC-7 (except use 1/2" x 1" sample)	5 hours
Tensile Strength and Elongation	ASTM D 1000 -Machine Direction -Cross Direction	56 lbs/in (981 N/100 mm), 117% 60 lbs/in (1051 N/100 mm), 90%

Performance properties tested on B-438 printed with alphanumerics, and a 5 mil and 10 mil minimum X dimension barcode using a Series R4300 ribbon and a BradyPrinter™ THT Model 203 Thermal Transfer Printer. Printed samples of B-438 were laminated to aluminum before exposure to the indicated environmental condition.

PERFORMANCE PROPERTIES	TEST METHODS	TYPICAL RESULTS
Long Term High Service Temperature	30 days at 104°F (40°C)	No visible effect

Long Term Low Service Temperature	30 days at -40°F (-40°C)	No visible effect
Humidity Resistance	30 days at 100°F (37°C), 95% R.H.	No visible effect
UV Light Resistance	30 days in UV Sunlighter™ 100	Slight yellowing of topcoat. No visible effect to print.
Weatherability	ASTM G155, Cycle 1 30 days in Xenon Arc Weatherometer	Topcoat whitens. No visible effect to print.

The tamper evident checkerboard pattern of B-438 was retained after exposure to all of the listed conditions. Laboratory testing has shown that the tamper-evidency checkerboard pattern of this product becomes nonfunctional after exposure to temperatures higher than 104°F.

PERFORMANCE PROPERTY	CHEMICAL RESISTANCE
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Samples printed with a BradyPrinter™ THT Model 203 using Brady Series R4300 ribbons and then laminated to aluminum panels. Test was conducted at room temperature after 24 hour dwell. Testing consisted of 5 cycles of 10 minute immersions in the specified chemical reagent followed by 30 minute recovery periods. After final immersion, samples rubbed 10 times with cotton swab saturated with test fluid.

CHEMICAL REAGENT	SUBJECTIVE OBSERVATION OF VISUAL CHANGE		
	LABEL STOCK SUBSTRATE/ ADHESIVE	R4300 PRINTING EFFECTS OF IMMERSION	R4300 PRINTING COTTON SWAB RUBS
Methyl Ethyl Ketone	Slight adhesive ooze	Ink removed	Not applicable
1,1,1-Trichloroethane	No visible effect	No visible effect	Ink removed
Toluene	No visible effect	No visible effect	Ink removed
Freon® TMS	No visible effect	No visible effect	Slight ink removal
Isopropyl Alcohol	No visible effect	No visible effect	Moderate ink removal
Mineral Spirits	No visible effect	No visible effect	No visible effect
JP-4 Jet Fuel	No visible effect	No visible effect	Slight ink removal
ASTM Reference Fuel B	No visible effect	No visible effect	No visible effect
SAE 20 WT Oil	No visible effect	No visible effect	No visible effect
Mil 5606 Oil	No visible effect	No visible effect	No visible effect
Rust Veto® 342	No visible effect	No visible effect	No visible effect
Skydrol® 500B-4	No visible effect	Severe ink removal	Ink removed
Super Agitene®	No visible effect	No visible effect	No visible effect
Deionized Water	No visible effect	No visible effect	No visible effect
3% Alconox® Detergent	No visible effect	No visible effect	No visible effect
10% Sodium Hydroxide Solution	No visible effect	No visible effect	No visible effect
10% Sulfuric Acid Solution	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 (27°C) 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:

- Alconox® is a registered trademark of Alconox Co.
- BradyPrinter™ is a trademark of Brady Worldwide, Inc.
- Freon® is a registered trademark of Du Pont de Nemours, E.I. and Company.
- Polyken™ is a trademark of Testing Machines Inc.
- Rust Veto® is a registered trademark of the E.F. Houghton & Co.
- 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 Graymills Corporation
- ASTM: American Society for Testing and Materials (U.S.A.)
- PSTC: Pressure Sensitive Tape Council (U.S.A.)
- SAE: Society of Automotive Engineers (U.S.A.)
- 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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