

**BRADY B-492 FREEZERBONDZ WHITE POLYESTER THERMAL PRINTABLE LABEL STOCK**

TDS No. B-492  
Effective Date: 06/02/2015

**Description:**

**GENERAL**

**Print Technology:** Thermal transfer  
**Material Type:** Polyester  
**Finish:** White film with white thermal transfer printable topcoat  
**Adhesive:** Permanent acrylic

**APPLICATIONS**

B-492 Freezerbondz™ markers are designed for use in laboratory identification such as vials, centrifuge tubes, test tubes, straws, and slides.

**RECOMMENDED RIBBONS**

Brady R6400  
Brady series R4300 (alternate)\*

**Please note that testing described in this Technical Data Sheet was performed on materials printed with the R6400 ribbon.**

\*Note: R4300 ribbon may be used if chemical resistance is not required with Ethanol, Toluene and Xylene.

**SPECIAL FEATURES**

B-492 Freezerbondz™ markers can be applied to frozen surfaces including glass and polypropylene stored in liquid nitrogen. B-492 offers excellent print smudge resistance, solvent resistance when using the R6400 Ribbon, and excellent low temperature performance. B-492 performs well in common laboratory environments such as liquid nitrogen and freezer applications.

Select the video links below for demonstration of product use.

**Details:**

PHYSICAL PROPERTIES	TEST METHODS	AVERAGE RESULTS
Thickness	ASTM D 1000 -Total (excluding liner)	0.0032 inch (0.081 mm)
Adhesion -Glass	ASTM D 1000 20 minute dwell 24 hour dwell	14 oz/inch (15.4 N/100 mm) 18 oz/inch (19.9 N/100 mm)
-Polypropylene	20 minute dwell 24 hour dwell	17 oz/inch (17.5 N/100 mm) 18 oz/inch (20.2 N/100 mm)
-Stainless steel	20 minute dwell 24 hour dwell	15 oz/inch (16.6 N/100 mm) 22 oz/inch (24.4 N/100 mm)

**ENVIRONMENTAL PERFORMANCE PROPERTIES - LABEL APPLIED TO ROOM TEMPERATURE SURFACE**

B-492 samples were printed with Series R6400 ribbon. Printed B-492 samples were laminated at room temperature to surfaces listed below and allowed to dwell 24 hours at room temperature prior to exposure to the indicated environments. Labels applied with three applications (gapped, overlapped [with 1/8" overlap], longitudinal to 1.5 mL Eppendorf tubes, 5 mL Cryogenic (polypropylene) vials, 15 mL and 50 mL Polypropylene tubes, 15 mL Glass tubes, wrapped around straws and flat on plastic Whirl-pak bags and boxes.

**NOTE for Surfaces:** Testing was completed on the following surfaces; Cardboard, Aluminum and Stainless steel boxes<sup>1</sup>; Eppendorf 1.5mL tube and tube tops<sup>1</sup>, Cryogenic (polypropylene) vials 5mL<sup>2</sup>, 50mL Polypropylene tubes<sup>1</sup>, 15mL Polypropylene tubes<sup>3</sup>, 15mL Glass tubes<sup>1</sup>, Plastic bags (Whirl-pak)<sup>4</sup> and Straws<sup>5</sup>

Manufacturer:

1 = VWR International

2 = Nalgene®

3 = Becton Dickinson Labware - Blue Max™ Jr.

4 = Nasco

5 = Pentatration inovation (Small straw #13441/0280), (Large straw #19042/0010)

ENVIRONMENT	TEST METHOD	TYPICAL RESULTS
High Service Temperature	30 days at elevated temperatures	Moderate discoloration at 230°F (110°C), no visible effect to print. Severe yellowing at 266°F (130°C), label still functional.
Liquid Nitrogen	3 cycles of 4 hours at -320°F (-196°C) and 20 hours at room temperature	<ul style="list-style-type: none"> <li>✓ Glass test tube 1/8" overlap, gapped, longitudinal</li> <li>✓ Polypropylene tube/vial 1/8" overlap, gapped, longitudinal</li> <li>✓ Glass microscope slide</li> <li>✓ Straws; Large &amp; Small</li> <li>◆ Plastic Whirl-Pak bags</li> <li>◆ Flat polypropylene</li> <li>✓ Aluminum foil</li> <li>✓ Aluminum and cardboard storage boxes</li> </ul>
Freezer	3 cycles of 16 hours at -112°F (-80°C) and 8 hours at room temperature	<ul style="list-style-type: none"> <li>✓ Glass test tube 1/8" overlap, gapped, longitudinal</li> <li>✓ Polypropylene tube/vial 1/8" overlap, gapped, longitudinal</li> <li>✓ Glass microscope slide</li> <li>✓ Straws; Large &amp; Small</li> <li>◆ Plastic Whirl-Pak bags</li> <li>✓ Flat polypropylene</li> <li>✓ Aluminum foil</li> <li>✓ Stainless steel, aluminum and cardboard storage boxes</li> </ul>
Liquid Nitrogen to boiling water	1 hour at -320°F (-196°C) then placed in boiling water 212°F (100°C) for 10 minutes	<ul style="list-style-type: none"> <li>✓ Glass test tube 1/8" overlap, gapped, overlapped</li> <li>✓ Polypropylene tube/vial, gapped</li> <li>◆ Polypropylene tube/vial, 1/8" overlapped, longitudinal</li> <li>◆ Glass microscope slide</li> <li>◆ Flat polypropylene</li> <li>✓ Aluminum foil</li> </ul>
Freezer to boiling water	1 hour at -112°F (-80°C) then placed in boiling water 212°F (100°C) for 10 minutes	<ul style="list-style-type: none"> <li>✓ Glass test tube 1/8" overlap, gapped, longitudinal</li> <li>✓ Polypropylene tube/vial, gapped</li> <li>◆ Polypropylene tube/vial, longitudinal, 1/8" overlap</li> <li>✓ Glass microscope slide</li> <li>✓ Flat polypropylene</li> <li>✓ Aluminum foil</li> </ul>

✓ = Label suitable for application; no visible effect, label remains adhered to test surface

◆ = Label may work in application; test results were mixed

✗ = Label not recommended for application; label came off either during testing or after test surface was removed from environment.

<sup>1</sup>Metal surfaces should be labeled at room temperature only.

#### ENVIRONMENTAL PERFORMANACE PROPERTIES - LABEL APPLIED TO COLD SURFACE

B-492 samples were printed with Series R6400 ribbon. Surfaces listed below were stored for 24 hours in either liquid nitrogen at -320°F (-196°C) or in a freezer at -112°F (-80°C). Printed B-492 samples were then laminated immediately after removal of the surfaces from liquid nitrogen or freezer. Labels were applied with three applications (gapped, overlapped [with 1/8" overlap], longitudinal) to glass test tubes (1.1 cm outer diameter) and polypropylene tubes (1.5 ml and 5 ml capacity).

ENVIRONMENT	TEST METHOD	TYPICAL RESULTS
Liquid Nitrogen	3 cycles of 4 hours at -320°F (-196°C) and 20 hours at room temperature	<ul style="list-style-type: none"> <li>✓ Glass test tube, 1/8" overlap</li> <li>✓ Polypropylene tube/vial, 1/8" overlap</li> <li>✓ Glass microscope slide</li> <li>◆ Flat polypropylene</li> <li>◆ Plastic Whirl-Pak bags</li> <li>✓ Straws; Large &amp; Small</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Aluminum foil</li> <li>✓ Cardboard storage boxes</li> </ul>
Freezer	3 cycles of 16 hours at -112°F (-80°C) and 8 hours at room temperature	<ul style="list-style-type: none"> <li>✓ Glass test tube, gapped</li> <li>◆ Glass test tube, longitudinal, 1/8" overlap</li> <li>✓ Polypropylene tube/vial, gapped,</li> <li>◆ Polypropylene tube/vial, 1/8" overlap, longitudinal</li> <li>◆ Plastic Whirl-Pak bags</li> <li>✓ Straws; Large &amp; Small</li> <li>✓ Glass microscope slide</li> <li>✓ Flat polypropylene</li> <li>✓ Aluminum foil</li> <li>✓ Stainless steel, aluminum and cardboard storage boxes</li> </ul>
Liquid Nitrogen to boiling water	1 hour at -320°F (-196°C) then placed in boiling water 212°F (100°C) for 10 minutes	<ul style="list-style-type: none"> <li>✓ Glass test tube, gapped</li> <li>◆ Glass test tube, 1/8" overlap, longitudinal</li> <li>✓ Polypropylene tube/vial 1/8" overlap</li> <li>◆ Glass microscope slide</li> <li>◆ Flat polypropylene</li> <li>✓ Aluminum foil</li> </ul>
Freezer to boiling water	1 hour at -112°F (-80°C) then placed in boiling water 212°F (100°C) for 10 minutes	<ul style="list-style-type: none"> <li>✓ Glass test tube, gapped</li> <li>◆ Glass test tube, 1/8" overlap, longitudinal</li> <li>✓ Polypropylene tube/vial 1/8" overlap</li> <li>✓ Glass microscope slide</li> <li>✓ Flat polypropylene</li> <li>✓ Aluminum foil</li> </ul>

**PERFORMANCE PROPERTIES - CHEMICAL**

Flat samples of B-492 were printed with Series R6400 ribbon. Printed samples were laminated and allowed to dwell 24 hours prior to testing. Test conducted at room temperature. Samples immersed in test solvents for 15 minutes. The samples were removed and rubbed 10 times with a cotton swab saturated with the test fluid. The rating scale below show the effect to the quality of the print for each sample.

CHEMICAL REAGENT	R6400 Ribbon EFFECT TO PRINT / TOPCOAT WITH RUB	R6400 Ribbon EFFECT TO PRINT / TOPCOAT WITHOUT RUB	R6400 Ribbon EFFECT TO LABEL STOCK	R4300 Ribbon EFFECT TO PRINT / TOPCOAT WITH RUB	R4300 Ribbon EFFECT TO PRINT / TOPCOAT WITHOUT RUB	R4300 Ribbon EFFECT TO LABEL STOCK
Ethanol	1	1	No visible effect	2	1	Slight print removal
Toluene	1	1	Slight edge infiltration or lifting	4	1	Severe print removal/smear
Isopropanol	1	1	Slight edge infiltration or lifting	2	1	Slight print smear/removal
Xylene	1	1	Slight edge infiltration or lifting	4	1	Severe print smear/removal
Dimethylsulfoxide (DMSO)	1	1	No visible effect	2	1	Slight print smear/removal
50% Acetic Acid	1	1	No visible effect	1	1	No visible effect
10% Sodium Hydroxide	4	4	Topcoat delams from label	4	4	No visible effect
10% Clorox® Bleach Solution	1	1	No visible effect	1	1	No visible effect

**Rating Scale Topcoat & Print**

- 1 = no visible effect
- 2 = slight smear or print removal, detectable but minimal smear
- 3 = moderate smear or print removal (print still legible)
- lifting
- 4 = severe smear or print removal (print illegible or just barely legible)

**Rating Scale - Adhesive**

- 1 = no visible effect
- 2 = slight effect, slight edge infiltration or lifting
- 3 = moderate effect, severe edge infiltration or lifting
- 4 = severe effect, severe edge infiltration

5 = complete print and/or topcoat removal

5 = label removed

**Storage Stability:**

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:**

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

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

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S. I.: International System of Units

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

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