

**BRADY B-490 FREEZERBONDZ MATTE WHITE POLYESTER THERMAL PRINTABLE LABEL STOCK**

TDS No. B-490  
Effective Date: 01/22/2015

**Description:**

**GENERAL**

**Print Technology:** Thermal transfer  
**Material Type:** White polyester  
**Finish:** White film with matte white thermal transfer printable coated ink  
**Adhesive:** Permanent acrylic

**APPLICATIONS**

B-490 Freezerbondz™ markers are designed for use in laboratory identification such as vials, centrifuge tubes, test tubes, straws, and slides.

**RECOMMENDED RIBBONS**

Brady Series R4300  
R6200 (alternate)\*

\*B-490 can be printed with R6200 ribbon; please note that testing described in this Technical Data Sheet was performed on materials printed with the R4300 ribbon.

**REGULATORY APPROVALS**

Brady B-490 is RoHS compliant to 2002/618/EC MCV amendment to RoHS Directive 2011/65/EU.

**SPECIAL FEATURES**

B-490 Freezerbondz™ markers can be applied to frozen surfaces including glass and polypropylene stored in liquid nitrogen. B-490 has good print smudge resistance, solvent resistance, and good high and low temperature performance. B-490 performs well in common laboratory environments such as liquid nitrogen and freezer applications. For tube/vial applications B-490 must be wrapped upon itself with at least 1/8 inch overlap.

**Details:**

PHYSICAL PROPERTIES	TEST METHODS	AVERAGE RESULTS
Thickness	ASTM D 1000 -Total (excluding liner)	0.0021 inch (0.05334 mm)
Adhesion -Glass	ASTM D 1000 20 minute dwell 24 hour dwell	15 oz/inch (16 N/100 mm) 19 oz/inch (21 N/100 mm)
-Polypropylene	20 minute dwell 24 hour dwell	12 oz/inch (13 N/100 mm) 16 oz/inch (18 N/100 mm)

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

B-490 samples were printed with Series R4300 ribbon on Bradyprinter™ THT Model 300X-Plus thermal transfer printer. Printed B-490 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 to glass test tubes (1.1 cm outer diameter) and polypropylene centrifuge tubes (1.1 cm inner diameter, 1.5 ml capacity) were wrapped with a 1/8" overlap.

ENVIRONMENT	TEST METHOD	TYPICAL RESULTS
High Service Temperature	30 days at elevated temperatures	Slight discoloration at 266°F (130°C), no visible effect to print. Material discolored but functional up to 320°F (160°C)
UV Light Resistance	ASTM G155, Cycle 1 without water spray 1000 hours in Xenon Arc Chamber	Slight discoloration of topcoat. Print is still legible.
Weatherability	ASTM G155, Cycle 1 1000 hours in Xenon Arc Weatherometer	Slight chalkiness of topcoat. Print is still legible but slightly faded.
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 centrifuge tube 1/8" overlap</li> <li>✓ Glass microscope slide</li> <li>✓ Flat polypropylene</li> <li>✓ Aluminum foil</li> </ul>

Freezer	3 cycles of 16 hours at -94°F (-70°C) and 8 hours at room temperature	<ul style="list-style-type: none"> <li>✓ Glass test tube 1/8" overlap</li> <li>✓ Polypropylene centrifuge tube 1/8" overlap</li> <li>✓ Glass microscope slide</li> <li>◆ Flat polypropylene</li> <li>✓ Aluminum foil</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</li> <li>✓ Polypropylene centrifuge tube 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 -94°F (-70°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</li> <li>✓ Polypropylene centrifuge tube 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

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

B-490 samples were printed with Series R4300 ribbon on Bradyprinter™ THT Model 300X-Plus thermal transfer printer. Surfaces listed below were stored for 24 hours in either liquid nitrogen at -320°F (-196°C) or in a freezer at -94°F (-70°C). Printed B-490 samples were then laminated immediately after removal of the surfaces from liquid nitrogen or freezer. Samples were allowed to dwell 24 hours at room temperature prior to exposure to the indicated environments. Labels applied to glass test tubes (1.1 cm outer diameter) and polypropylene centrifuge tubes (1.1 cm inner diameter, 1.5 ml capacity) were wrapped with a 1/8" overlap.

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 centrifuge tube 1/8" overlap</li> <li>✓ Glass microscope slide</li> <li>✓ Flat polypropylene</li> <li>✓ Aluminum foil</li> </ul>
Freezer	3 cycles of 16 hours at -94°F (-70°C) and 8 hours at room temperature	<ul style="list-style-type: none"> <li>✓ Glass test tube 1/8" overlap</li> <li>✓ Polypropylene centrifuge tube 1/8" overlap</li> <li>✓ Glass microscope slide</li> <li>✓ Flat polypropylene</li> <li>✓ Aluminum foil</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</li> <li>✓ Polypropylene centrifuge tube 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 -94°F (-70°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</li> <li>✓ Polypropylene centrifuge tube 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

#### PERFORMANCE PROPERTIES - CHEMICAL

Flat samples of B-490 were printed with Series R4300 ribbon on Bradyprinter™ THT Model 300X-Plus thermal transfer printer. Printed samples were laminated and allowed to dwell 24 hours prior to testing. Test conducted at room temperature. Samples were 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 shows the effect to the quality of the print for each sample.

CHEMICAL REAGENT	EFFECT TO PRINT WITH RUB	EFFECT TO PRINT WITHOUT RUB	EFFECT TO LABEL STOCK
Ethanol	2	1	No visible effect
Toluene	3	1	Slight adhesive ooze
Isopropanol	2	1	No visible effect

Xylene	3	1	Slight adhesive ooze
Dimethylsulfoxide (DMSO)	2	1	No visible effect
Methylene Chloride	4	1	Slight adhesive ooze
50% Acetic Acid	1	1	No visible effect
10% Sodium Hydroxide	1	1	No visible effect
10% Clorox® Bleach Solution	1	1	No visible effect

**Rating Scale:**

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

**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:**

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 Clorox® is a registered trademark of The Clorox Company.  
 Freezerbondz™ is a trademark of Brady Worldwide, Inc.  
 ASTM: American Society for Testing and Materials (U.S.A.)

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

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