

**BRADY B-345 HIGH TEMPERATURE PERMASLEEVE® MARKER**

TDS No B-345  
Effective Date: October 2021

**Description:**

**GENERAL**

Print Technology: Thermal Transfer  
Material Type: Irradiated polyvinylidene fluoride heat shrink tubing  
Finish: Matte  
Shrink Ratio: 2:1 (3/32" is 3:1)

**APPLICATIONS**

B-345 PermaSleeve® Markers are designed for wire identification and insulation purposes. B-345 sleeves are suitable for numerous high temperature and/or low outgassing applications. B-345 sleeves are also recommended for applications that require greater resistance to harsh chemicals such as fuels, lubricants, and high power cleaning solvents.

**RECOMMENDED RIBBONS**

Brady R6000 Series and Brady R6600 Series black ribbons  
Brady R4400W Series and Brady R6800 Series white ribbons

**REGULATORY/AGENCY APPROVALS**

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](http://www.bradycanada.ca/weee-rohs)

In Europe: [www.bradyeurope.com/rohs](http://www.bradyeurope.com/rohs)

In Japan: [www.brady.co.jp/products/labelsuse/rohs](http://www.brady.co.jp/products/labelsuse/rohs)

All other regions: [www.bradyid.com/weee-rohs](http://www.bradyid.com/weee-rohs)

**SPECIAL FEATURES**

The recommended operating temperature range for B-345 PermaSleeve® markers is -55°C (67°F) to +225°C (437°F).

A minimum recovery temperature of 155°C (311°F) is recommended for B-345 PermaSleeve® markers.

B-345 PermaSleeve® markers meet the requirements of SAE-AS5492 Marking of Electrical Insulating Materials, and MIL-STD-202 Method 215 Resistance to Solvents, when printed with the recommended ribbons.

B-345 PermaSleeve® Markers meet the requirements of NASA Vacuum Outgassing Specification SP-R-0022A

B-345 PermaSleeve® markers meet the copper mirror corrosion requirements of SAE-AS23053/18 when tested in accordance with SAE-AS23053™A, General Specification for Insulation Sleeving, Electrical, Heat Shrinkable.

B-345 PermaSleeve® markers are supplied in roll form, in a flattened format, on a carrier designed for use with thermal transfer printers.

B-345 PermaSleeve® markers are available in white, black, yellow, blue, and pink.

**Details:**

MARKER SIZE		RANGE OF WIRE DIAMETERS (in)	RANGE OF WIRE DIAMETERS (mm)
3/32"	3HT-094	0.031-0.080	0.8-2.0
1/8"	2HT-125	0.063-0.110	1.6-2.8
3/16"	2HT-187	0.094-0.150	2.4-3.8
1/4"	2HT-250	0.125-0.215	3.2-5.5
3/8"	2HT-375	0.187-0.320	4.8-8.1
1/2"	2HT-500	0.250-0.450	6.4-11.4
3/4"	2HT-750	0.375-0.700	9.5-17.8
1"	2HT-1000	0.450-0.950	11.4-24.1
1-1/2"	2HT-1500	0.750-1.450	19.1-36.8

PHYSICAL PROPERTY	TEST METHOD	AVERAGE RESULT
Copper Mirror Corrosion	SAE AS23053A 16 hours at 200°C (392°F)	Meets AS23053/18 requirements
Vacuum Outgassing	ASTM E595; NASA SP-R-0022A Total Mass Loss (TML)  Collected Volatile Condensable Material (CVCM)  Water Vapor Recovered (WVR)	Total Mass Loss (TML) ≤ 1.0%  Collected Volatile Condensable Material (CVCM) ≤ 0.1%  Water Vapor Recovered (WVR) ≤ 0.1%
Flammability	ASTM D2671 Procedure C	Meets AS23053/18 requirements
Surface Flammability	ASTM E162 Flame Spread Index ( $I_s$ ) [rounded average of 4 test results]	≤ 35
Specific Optical Density of Smoke (Ds)	ASTM E662 Specific Optical Density ( $D_s$ ) [average of 3 test results]	Flaming and Non-Flaming Mode at 1.5 minutes ≤ 100  Flaming and Non-Flaming Mode at 4.0 minutes ≤ 200
Heat Resistance	SAE AS23053/18 168 hours at 225°C (437°F)	Elongation ≥ 250%
Heat Shock	SAE AS23053/18 4 hours at 275°C (527°F), followed by 360 degree bend around 3/8" mandrel	No cracking, flowing or dripping  White: Print legible (R6000) Yellow: Print Legible (R6000) Black: Print legible (R6800)
Temperature Cycling	SAE AS5942 6 cycles of 30 min at -196°C (-321°F), followed by 30 min at 200°C (392°F)	No cracking, flowing or dripping Print is legible after 20 eraser rubs  White: Print legible (R6000) Yellow: Print Legible (R6000) Black: Print legible (R6800)
Dielectric Strength	SAE AS23053/18	≥ 400 V/mil
Volume Resistivity	SAE AS23053/18	≥ 1x10 <sup>11</sup> Ohm-cm
Ultimate Elongation	SAE AS23053/18 2" jaw separation, 2 in/min	≥ 300%
Tensile Strength	SAE AS23053/18 2" jaw separation, 2 in/min	≥ 2500 psi
Fungus	SAE AS23053/18 ISO846 fungus exposure (56d)	Tensile Strength ≥ 2500 psi Elongation ≥ 300% Dielectric Strength ≥ 400 V/mil
Print Adherence	SAE AS5942 Grade A-A-132 pink eraser 2 lb weight	White (Recovered): R6000 - Print legible after 100 rubs R6600 - Print legible after 40 rubs  Yellow (Recovered): R6000 - Print legible after 100 rubs  Black (Recovered): R6800 - Print legible after 100 rubs

Fluid Resistance	<p>Immersion for 24 hours at 23°C (73°F) followed by SAE AS5942 (2 lb weight, 20 eraser rubs)</p> <p>Fluids: 5% sodium chloride in water MIL-T-83133 JP-8 Jet Fuel MIL-L-23699 Oil 50% Propylene glycol deicer Skydrol® 500B-4 Isopropyl Alcohol</p>	<p>White (Recovered): Print legible (R6000)</p> <p>Yellow (Recovered): Print legible (R6000)</p> <p>Black (Recovered): Print legible (R6800)</p>
Fluid Resistance	<p>MIL-STD-202 Method 215 w/ Change 1 3 cycles of 3 minute fluid immersion followed by 10 toothbrush rubs after each immersion</p>	<p>White (Recovered): Solvent 1 - R6000 Pass R6600 Pass</p> <p>Solvent 2 - R6000 Pass R6600 Pass</p> <p>Solvent 3 - R6000 Pass R6600 Pass</p> <p>Solvent 4 - R6000 Pass R6600 Pass</p>

MIL-STD-202 Method 215 Fluids:

Solvent 1: 1 part isopropyl alcohol, 3 parts mineral spirits, at 25°C

Solvent 2: BIOACT® EC-7R™ terpene defluxer, at 25°C

Solvent 3: 42 parts water, 1 part propylene glycol monomethyl ether, 1 part monoethanolamine, at 70°C

Solvent 4: Isopropyl alcohol, at 25°C

Environmental exposure performance properties tested on B-345 white, yellow, blue and pink samples printed with R6000 Series and R6600 Series black ribbons. B-345 black samples were printed with R4400W and R6800 Series white ribbons. Unless otherwise indicated, samples were recovered at 200°C (392°F) for 3 minutes and allowed to dwell at room temperature for 24 hours prior to testing.

ENVIRONMENTAL EXPOSURE PERFORMANCE PROPERTY	TEST METHOD	TYPICAL RESULTS
High Service Temperature	5 minutes at 260°C (500°F)	<p>White: Slight discoloration of sleeve; no visible effect to print</p> <p>Yellow: No visible effect to tubing or print</p> <p>Pink and Blue: Very slight discoloration of tubing, no visible effect to print</p> <p>Black: No visible effect to tubing, slight discoloration of print</p>
	24 hours at 180°C (356°F)	<p>White: Moderate discoloration of sleeve; no visible effect to print</p> <p>Yellow: no visible effect to tubing or print</p> <p>Pink and Blue: Very slight discoloration of tubing, no visible effect to print</p> <p>Black: No visible effect to tubing, slight discoloration of print</p>

High Service Temperature	1000 hours at 130°C (266°F)	White: Moderate discoloration of sleeve; no visible effect to print Yellow: No visible effect to tubing or print Pink and Blue: Very slight discoloration of tubing, no visible effect on print Black: No visible effect to tubing or print
Low Service Temperature	1000 hours at -80°C (-112°F)	All colors: No visible effect to sleeve or print
Weatherability	ASTM G155 Cycle 1 1000 hours in Xenon Arc Weatherometer	White, Yellow, Pink and Black: No visible effect to sleeve or print Blue: Slight tube darkening, no visible effect to print
UV Light Resistance	ASTM G155 Cycle 1 Dry 1000 hours	All colors: No visible effect to sleeve or print
Humidity Resistance	1000 hours at 38°C (100°F) and 95% RH	All colors: No visible effect to sleeve or print
Salt Fog	ASTM B117 1000 hours in 5% Salt Fog Chamber	All colors: No visible effect to sleeve or print

Shelf life is five years from the date of receipt for this product as long as this product is stored in its original packaging in an environment of 0-35°C (32-95°F) 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 applications.

**Trademarks:**

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

SAE: SAE International®

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EC-7R™ is a trademark of Petroferm, Inc.

PermaSleeve® is a registered trademark of Brady Worldwide, Inc.

Skydrol® is a registered trademark of the Monsanto Company

**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.

**WARRANTY**

Brady products are sold with the understanding that the buyers will test them in actual use and determine for themselves their adaptability to their intended uses. Brady warrants to the buyers that its products are free from defects in material and workmanship, but limits its obligation under this warranty to replacement of the product shown to Brady's satisfaction to have been defective at the time Brady sold it. This warranty does not extend to any persons obtaining the product from the buyers. This warranty is in lieu of any other warranty, express or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose, and of any other obligations or liability on Brady's part. Under no circumstances will Brady be liable for any loss, damage, expense, or consequential damages of any kind arising in connection with the use, or inability to use, Brady's products.

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