

## BRADY B-7641 LOW SMOKE ZERO HALOGEN PERMASLEEVE® MARKER

TDS No. B-7641

Effective Date: 01/12/2015

### Description:

#### GENERAL

**Print Technology:** Thermal transfer

**Material Type:** Heat shrinkable (2:1), low smoke, zero halogen, flame retardant, polyolefin sleeves.

### APPLICATIONS

B-7641 PermaSleeve® Markers are designed for wire identification and insulation purposes. These sleeves are suitable for use in applications that require low smoke, halogen free, flame retardant markers.

### RECOMMENDED RIBBONS

Brady R6000 halogen free series black ribbon

Brady R6600 series black ribbon

### REGULATORY APPROVALS

Brady B-7641 PermaSleeve® is RoHS 2011/65/EU compliant

### SPECIAL FEATURES

B-7641 PermaSleeve® Markers meet industry standard BS6853 (1999) vehicle category 1a

B-7641 PermaSleeve® Markers meet European standard EN 45545-2, requirement set R22/R23, vehicle category HL3

B-7641 PermaSleeve® Markers are supplied in roll form in a flattened format on a carrier designed for use with thermal transfer printers.

B-7641 PermaSleeve® is available in white and yellow. Other non stock colors are also available.

### Details:

B-7641 is available in following dimensions

MARKER SIZE (inch)	MARKER SIZE (mm)	RANGE OF WIRE DIAMETERS (in)	RANGE OF WIRE DIAMETERS (mm)	WEIGHT (g/inch)
3/32	2.4	0.047-0.080	1.19-2.03	0.08
1/8	3.2	0.062-0.110	1.57-2.8	0.14
3/16	4.8	0.094-0.150	2.39-3.81	0.18
1/4	6.4	0.125-0.215	3.18-5.46	0.27
3/8	9.5	0.188-0.320	4.78-8.13	0.40
1/2	12.7	0.250-0.450	6.35-11.43	0.56
3/4	19.1	0.375-0.700	9.53-17.78	0.96
1	25.4	0.500-0.950	12.7-24.13	1.25
1 1/2	38.1	0.750-1.450	19.05-36.83	2.30
2	50.8	1.000-1.950	25.4-49.53	3.00

PHYSICAL PROPERTIES	TEST METHODS	AVERAGE RESULTS
Ultimate elongation	ASTM D 638	200%
Longitudinal Change	ASTM D2671	-10% to +5%
Specific gravity	ASTM D 792	1.4 g/cm³
Water absorption	ASTM D 570	≤ 0.15%
Flammability	ASTM D635-HB	Pass
Oxygen Index	LUL1-085, EN 45545-2, BS6853 (BS ISO 4589-2)	>34%
Smoke Density	LUL 1-085 BS6853:1999 Annex D8.3	<0.017
Toxic Fume	LUL 1-085, BS6853:1999 Annex B using the method NF X 70-100	<1.0
Dripping Classification	DIN 5510-2	ST-2

ELECTRICAL PROPERTIES	TEST METHODS	AVERAGE RESULTS
Dielectrical strength	ASTM D 2671	20 kV/mm
Volume Resistivity	ASTM D 257	

10<sup>14</sup>ohm.cm

TEMPERATURE PROPERTIES	TEST METHODS	AVERAGE RESULTS
Heat shock	ASTM D 2671, 4 hours at 175°C	No dripping, cracking or flowing
Heat aging	ASTM D 638, 168 hours 150°C	Elongation ≥ 100%
Low temperature flexibility	IEC 60684-2, -55°C	No cracking, no breaking
Operating temperature		-55°C to 105°C
Minimum shrink temperature		90°C

B-7641 Permasleeve® white and yellow were printed on the Brady PR Plus (600 dpi) with R6000 halogen free and with R6600 Series black ribbon. The results were the same with all ribbons unless otherwise stated.

PERFORMANCE PROPERTY	TEST METHODS	AVERAGE RESULTS
High Service Temperature	5 minutes at 500°F (260°C)	White: Slight discoloration of tubing, no visible effect to printing Yellow: Slight discoloration of tubing, No visible effect to printing
	24 hours at 350°F (180°C)	White: Slight discoloration of tubing, no visible effect to printing Yellow: Slight discoloration of tubing, no visible effect to printing
	1000 hours at 221°F (110°C)	White: No visible effect Yellow: No visible effect
Low Service Temperature	1000 hours at -94°F (-70°C)	White: No visible effect Yellow: No visible effect
Weatherability	ASTM G155 Cycle 1 1000 hours in Xenon Arc Weatherometer	White: No visible effect to tubing or printing Yellow: No visible effect to tubing or printing
UV Light Resistance	ASTM G155 Cycle 1 dry 1000 hours	White: No visible effect to tubing or printing Yellow: No visible effect to tubing or printing
Humidity Resistance	1000 hours at 100°F (37°C) /95% RH	White: No visible effect Yellow: No visible effect
Print Adherence per SAE-AS5942 (sec 4.1)	50 eraser rubs with 1 Kg pressure	White: Pass Yellow: Pass
Solvent Resistance per SAE-AS81531 (Sec 3.4.3) Solution A Solution C Solution D	Samples tested after unrestricted shrinkage at 200°C for 3 minutes  MIL-STD-202G, Method 215K 3 cycles of 3 minute immersions in specified fluids followed by toothbrush rub after each immersion	White: Pass Yellow: Pass

Solution A: 1 part isopropyl alcohol, 3 parts mineral spirits

Solution C : BIOACT®EC-7R™ terpene defluxer

Solution D : 42 parts water, 1 part polypropylene glycol monomethyl ether, 1 part monoethanolamine at 70°C

PERFORMANCE PROPERTY	CHEMICAL RESISTANCE
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B-7641 white and yellow samples were thermal transfer printed using the R6600 Series thermal transfer ribbon and shrunk on appropriate sized wires. 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. Samples rubbed 20 times with a cotton swab saturated with the chemical reagent after final immersion. The rating scale below shows the effect to the quality of the print for each sample. Results are the same for each color unless otherwise noted.

CHEMICAL REAGENT	SUBJECTIVE OBSERVATION OF VISUAL CHANGE	
	TUBING AND PRINTING WITHOUT SWAB RUB	PRINTING WITH SWAB RUB
Isopropyl alcohol	1	1
Toluene	1	1

SAE 15W20 Oil	1	1
MIL 5606 oil	Tubing stained by oil, no visible effect on printing	1
MIL 7808 oil	1	1
10% NaCl solution	1	1
Brake Fluid DOT 3	1	1
JP-8 Jet Fuel	1	1
Gasoline	1	1
Diesel Fuel	1	1
Skydrol® 500B-4	1	1
Kerosene	1	1
Propylene Glycol	1	1
Mineral Spirits	1	1
Deionized Water	1	1
Methyl Ethyl Ketone	1	1
Acetone	1	1

Rating Scale:

1=no visible effect

2=slight fading or print removal

3=moderate fading or print removal (print still legible)

4=severe fading or print removal (print illegible or just barely legible)

5=complete print removal

NP=print removed prior to rub

B-7641 white and yellow samples were thermal transfer printed using the R6000 halogen free Series thermal transfer ribbons and shrunk on appropriate sized wires. 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. Samples rubbed 20 times with a cotton swab saturated with the chemical reagent after final immersion. The rating scale below shows the effect to the quality of the print for each sample. Results are the same for each color unless otherwise noted.

CHEMICAL REAGENT	SUBJECTIVE OBSERVATION OF VISUAL CHANGE	
	TUBING AND PRINTING WITHOUT SWAB RUB	PRINTING WITH SWAB RUB
Isopropyl alcohol	1	1
Toluene	1	5
SAE 15W20 Oil	1	1
MIL 5606 oil	Tubing stained by oil, no visible effect on printing	1
MIL 7808 oil	1	1
10% NaCl solution	1	1
Brake Fluid DOT 3	1	1
JP-8 Jet Fuel	1	1
Gasoline	1	5
Diesel Fuel	1	1
Skydrol® 500B-4	1	1
Kerosene	1	1
Propylene Glycol	1	1
Mineral Spirits	1	1
Deionized Water	1	1
Methyl Ethyl Ketone	1	4
Acetone	1	4

Rating scale:

1=no visible effect

2=slight print fade or removal

3=moderate print fade or removal (print still legible)

4=severe print fade or removal (print illegible or just barely legible)

5=complete print fade or removal

NP=print removed prior to rub

Product testing, customer feedback and history of similar products support a customer performance expectation of at least five years from the data of receipt for this product as long as this product is stored in its original packaging in an environment at 65 to 95 degrees F (18 to 35 degrees C) per SAE-AMS-DTL 23053/5C. We are confident that our products 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.)

BIOACT® is a registered trademark of Petroferm, Inc.

DIN: Deutsche Industry Norm

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

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

S. I.: International System of Units

Skydrol® is a registered trademark of Solutia Inc.

**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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