

BRADY B-593 RAISED PANEL LABEL

TDS No. B-593

Effective Date: 1/02/2020

GENERAL

Print Technology: Thermal Transfer

Material Type: Polyester

Finish: Gloss

Colors: White, Black, Yellow, Silver, Red, Green

Adhesive: Permanent Acrylic, Foam Backed

APPLICATIONS

B-593 Raised Panel labels are designed for patch panel identification in identifying external push-buttons, switches, and internal connection points. B-593 is also used as rating and serial plates using alphanumeric characters that require name plate quality.

RECOMMENDED RIBBONS

Brady Series R6000 Halogen Free

Brady Series R4400 white

REGULATORY/AGENCY APPROVALS

UL: B-593 (white, metallized, yellow, red and green) is a UL Recognized Component when printed with the Brady Series R6000 and the Brady Series R6000 Halogen Free ribbons. B-593 (red, green and black) is a UL Recognized Component when printed with the Brady Series R4400 white ribbon. See UL file MH17154 for specific details. UL information can be accessed on-line at UL.com in the UL Product iQ area.

cUL: B-593 (white, metallized, yellow, red and green) is a cUL Recognized Component when printed with the Brady Series R6000 ribbon. B-593 (red, green and black) is a cUL Recognized Component when printed with the Brady Series R4400 white ribbon. See UL file PGJ18.MH17154 for specific details. UL information can be accessed on-line at UL.com in the UL Product iQ area.

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

In Europe: www.bradyeurope.com/rohs

In Japan: www.brady.co.jp/products/labelsuse/rohs

All other regions: www.bradyid.com/weee-rohs

SPECIAL FEATURES

Brady B-593 Raised Panel Labels have been found to be functional for the following outdoor durations based on long term accelerated weathering tests:

| Brady B-593 Label Color/Ribbon | Estimated Outdoor Durability |
|--------------------------------|------------------------------|
| White/R6000 Black | 10 years |
| Yellow/R6000 Black | 5 years |
| Silver/R6000 Black | 5 years |
| Green/R6000 Black | 5 years |
| Red/R6000 Black | 5 years |
| Red/R4400 White | 3 years |
| Black/R4400 White | 3 years |
| Green/R4400 White | 3 years |

Details regarding label and print appearance are given in the Performance Properties - Environmental section below.

Details:

| PHYSICAL PROPERTIES | TEST METHODS | AVERAGE RESULTS |
|-----------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Thickness | ASTM D 1000 - Substrate - Foam backed adhesive - Total (excluding liner) | 0.0079 inch (0.200 mm) 0.0177 inch (0.450 mm) 0.0256 inch (0.650 mm) |
| Adhesion to: | ASTM D 1000 | |
| -Stainless Steel | 20 minute dwell 24 hour dwell | 189 oz/inch (>200 N/100 mm) 289 oz/inch (>200 N/100 mm) |
| -Smooth ABS | 20 minute dwell 24 hour dwell | 24 oz/inch (26 N/100mm) 64 oz/inch (70 N/100 mm) |
| -Powdercoated surface | 20 minute dwell 24 hour dwell | 41 oz/inch (45 N/100mm) 69 oz/inch (76 N/100 mm) |
| -Polyethylene | 20 minute dwell 24 hour dwell | 28 oz/inch (31 N/100mm) 37 oz/inch (40 N/100 mm) |
| Drop Shear | PSTC-7 (except use 1/2" x 1" sample) | 35 hours |
| Tack | ASTM D2979 Polyken™ Probe Tack (0.5 second dwell) | 16.5 oz (469 g) |

| PERFORMANCE PROPERTIES | ENVIRONMENTAL |
|------------------------|---------------|
|------------------------|---------------|

B-593 white, silver, yellow, red and green label samples were printed with the Brady Series R6000 Halogen Free ribbon and B-593 black, red and green label samples were printed with the Brady Series R4400W ribbon and dwelled for 24 hours prior to test.

| PERFORMANCE PROPERTIES | TEST METHODS | TYPICAL RESULTS White B-593/R6000 Halogen Free | TYPICAL RESULTS Black B-593 /R-4400W | TYPICAL RESULTS Metallized B-593/R-6000 Halogen Free |
|--------------------------|----------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------|
| High Service Temperature | 1000 hours at 100°C (212°F) | No visible effect | No visible effect | No visible effect |
| Low Service Temperature | 1000 hours at -20°C (-4°F) | No visible effect | No visible effect | No visible effect |
| Humidity Resistance | 1000 hours at 37°C (100°F), 95% R.H. | No visible effect | No visible effect | No visible effect |
| Salt fog | 1000 hours at 5% Salt Spray | No visible effect | No visible effect | No visible effect |
| Abrasion Resistance | Taber Abraser, CS-10 wheels, 500 g/arm (Fed. Std. 191A, Method 5306) | Number of cycles until print is illegible 175 cycles | Number of cycles until print is illegible 75 cycles | Numbers of cycles until print is illegible 175 cycles |

Brady B-593 labels underwent accelerated weathering testing (ASTM G155, Cycle 1) over the course of one year. Observations regarding the appearance of the B-593 labels and print on the labels were made at 4 intervals during the one year and are given in the table below.

| Weatherometer Duration | Label Color | Effect to Label and Print | | |
|------------------------|-------------|---------------------------|----------------------------------------------|----------------------------------|
| | | Effect to Label Color | Effect To R6000 Halogen Free Series Printing | Effect to R4400W Series Printing |

| | | | | |
|------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 1000 hours | White Red Green Yellow Silver Black | No visible effect Slight discoloration Slight discoloration No visible effect No visible effect No visible effect | No visible effect for all label colors. n/a | n/a No visible effect No visible effect n/a n/a No visible effect |
| 2400 hours | White Red Green Yellow Silver Black | No visible effect Severe discoloration, retains a trace of red Moderate discoloration Slight discoloration Slight discoloration Slight loss of gloss | No visible effect Slight print fade No visible effect No visible effect No visible effect n/a` | n/a Slight print fade No visible effect n/a n/a no visible effect |
| 4800 hours | White Red Green Yellow Silver Black | No visible effect Severe discoloration, retains a trace of red Moderate discoloration Slight discoloration Moderate discoloration Slight loss of gloss | No visible effect Slight print fade No visible effect No visible effect No visible effect n/a | n/a slight print discoloration slight print discoloration n/a n/a no visible effect |
| 9100 hours | White Red Green Yellow Silver Black | Slight discoloration Severe discoloration, retains a trace of red Moderate discoloration Moderate discoloration Severe discoloration Slight loss of gloss | No visible effect Slight print fade Slight print fade Slight print fade Slight print fade n/a | Severe print removal, print is barely legible* n/a n/a no visible effect |

Based on internal testing results, 800 hours in the Weatherometer is *approximately* equivalent to one year of outdoor exposure in Wisconsin.

*print can be rubbed off with finger

| PERFORMANCE PROPERTY | CHEMICAL RESISTANCE |
|----------------------|---------------------|
|----------------------|---------------------|

B-593 white printed with the Brady Series R6000 Halogen Free ribbon and B-593 black printed with the Brady Series R4400 white ribbon, and dwelled 24 hours prior to test. 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 - B-593 White | |
|----------------------------|-------------------------------------------------------|----------|
| | EFFECTS TO THE PRINTED IMAGE | |
| | R6000 Halogen Free | |
| | Without Rub | With Rub |
| Isopropyl alcohol | 1 | 1 |
| Methyl ethyl ketone | 1 | 5 |
| Alcohol mix* | 1 | 1 |
| Gasoline | 1 | 1 |
| Diesel | 1 | 1 |
| Skydrol® 500B-4 | 1 | 2-3 |
| Mil 5606 Oil | 1 | 1 |
| 5% Sodium hydroxide | 1 | 1 |
| 10% Sulfuric acid solution | 1 | 1 |
| Deionized water | 1 | 1 |
| 10% Salt water solution | 1 | 1 |
| n-Hexane | Not tested | |

| | | |
|-------------|------------|---|
| Iso-octane | Not tested | |
| Ethanol | 1 | 1 |
| ASTM #3 oil | 1 | 1 |
| Acetone | 1 | 5 |

* Alcohol mix is 50% ethanol, 30% methanol, and 20% water by volume.

| CHEMICAL REAGENT | SUBJECTIVE OBSERVATION OF VISUAL CHANGE – B-593 Black | |
|----------------------------|-------------------------------------------------------|----------|
| | EFFECTS TO THE PRINTED IMAGE | |
| | R4400W | |
| | Without Rub | With Rub |
| Isopropyl alcohol | 1 | 5 |
| Methyl ethyl ketone | NP | NP |
| Alcohol mix* | 1 | 1 |
| Gasoline | 1 | 5 |
| Diesel | 1 | 1 |
| Skydrol® 500B-4 | NP | NP |
| Mil 5606 Oil | 1 | 1 |
| 1,1,1-Trichloroethane | 1 | 5 |
| 5% Sodium hydroxide | 1 | 1 |
| 10% Sulfuric acid solution | 1 | 1 |
| Deionized water | 1 | 1 |
| 10% Salt water solution | 1 | 1 |
| n-Hexane | 1 | 1 |
| Iso-octane | 1 | 1 |
| Ethanol | 1 | 4 |
| ASTM #3 oil | 1 | 4 |
| Acetone | NP | NP |

* Alcohol mix is 50% ethanol, 30% methanol, and 20% water by volume.

Rating Scale:

1=no visible effect

2=slight print smear, fade or removal

3=moderate smear, fade or print removal (print is still legible)

4=severe smear, fade or print removal

5=complete print and/or topcoat removal

NP=print removed during immersion

Shelf Life:

Shelf life is 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° F (27° C) 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 application.

Trademarks:

Polyken™ is a trademark of Testing Machines Inc.

Skydrol® is a registered trademark of the Monsanto Company

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

S. I.: International System of 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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