

**Brady Off-metal RFID Integrated Label**

TDS No. B-1120

Effective Date:

**Description**

Brady off-metal RFID integrated labels incorporate extended temperature range chip technology with durable label materials to withstand challenging environments on non-metal surfaces.

Print Technology

Thermal transfer print

Recommended Ribbon

Brady Series R6400

Material Type

White PET film (1.6 mil)

Adhesive

N/A

Shelf Life

2 years

User Memory

512 bits

EPC Bank

96 bit EPC memory, extensible to 480-bits

TID Bank

32 bits (64 bit unique TID)

Regulatory

ATA Spec 2000 Ch 9 Rev 2016.1

SAE AS5678 2006-12

Label Dimensions

Units	English			Metric (mm)		
	Width (in)	Length (in)	Thickness (mil)	Width	Length	Thickness
RFID-THT-.5KB-101.6x25.4-1120-.5						

Liner thickness on the Brady off-metal RFID integrated label is 4.6 mil (0.12 mm). Tag thickness is measured at the center of the tag over the epoxy bump.

Label Mass

Catalog Number	Label Mass (g)

Approximate Read Range

Catalog Number	Surface	Average Read Range (m)*

\*Results dependent on conditions used for testing, actual performance will vary depending on environment and substrate composition. See *Read Range and Orientation Testing Methodology* for additional detail.

**Surface Dependent Testing**

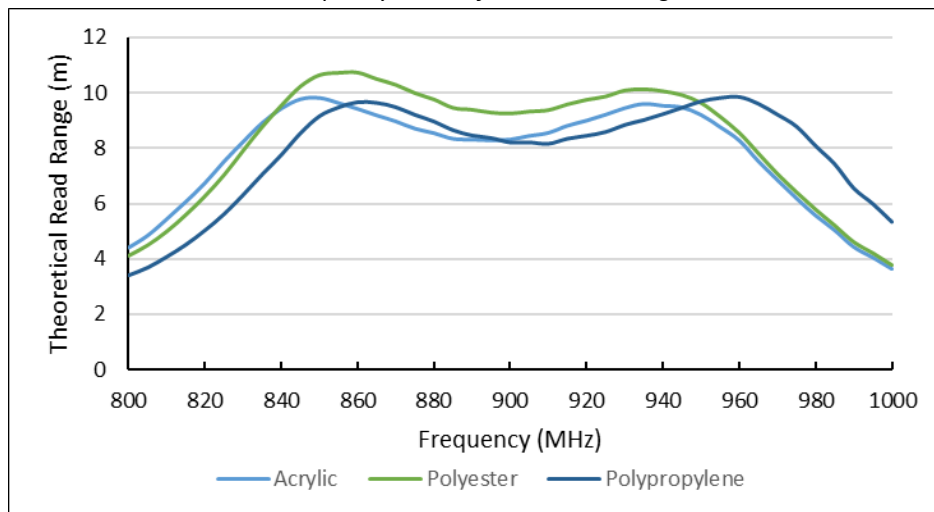
*Surface Dependent Read Range\**

Catalog Number	RFID-THT-.5KB-101.6x25.4-1101-.5	
Surface	EU Average (m)	US Average (m)
Acrylic		
High Temperature Polyvinyl Chloride (HTPVC)		
Nylon		
Polycarbonate		
Polyether Ether Ketone (PEEK)		
Polyester (PET)		
Polypropylene		
Ultra High Molecular Weight Polyethylene (UHMWPE)		
Ultem™		

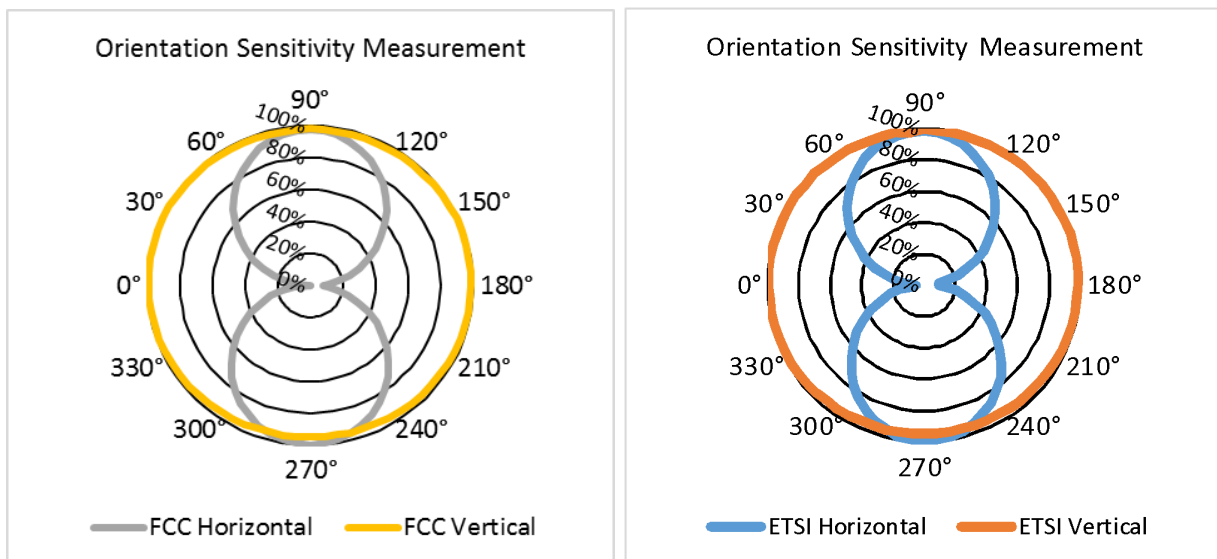
\*Results dependent on conditions used for testing, actual performance will vary depending on environment and substrate composition. See *Read Range and Orientation Testing Methodology* for additional detail.

**Read Range and Orientation**

*Frequency Scans of B-1120 RFID Tag*



*Orientation Testing*



*Read Range and Orientation Methodology*

Read range and orientation measurements were performed using a patch antenna in an anechoic environment. Sample to antenna distance used for read range and orientation sensitivity measurements was 0.5 m for all tags. EU orientation sensitivity was measured at 866 MHz and US orientation sensitivity was measured at 915 MHz. An orientation of 90° indicates that the antenna is perpendicular to the RFID tag. EU read range was measured at 865 MHz and US read range was measured at 905 MHz. All surfaces tested were 0.062” thick. US read range measurements were adjusted by +10% to account for US antenna power. The Brady Off-metal RFID Integrated Label must be sufficiently distanced from a conductive surface to read from an adequate range.

**Environmental Testing**

The Brady Off-metal RFID Integrated Label is AS5678 2006-12 compliant for the following environmental tests.

*AS5678 Environmental Compliance*

<b>Environmental Requirement*</b>	<b>Environmental Test Reference Document</b>	<b>Performance Standard</b>	<b>Pass/Fail</b>
Operating Temperature	RTCA DO-160E, Section 4	Data integrity	
Survival Temperature	RTCA DO-160E, Section 4	Data integrity	
Altitude	RTCA DO-160E, Section 4	Data integrity	
Decompression	RTCA DO-160E, Section 4	Data integrity	
Over Pressure	RTCA DO-160E, Section 4	Data integrity	
Humidity	RTCA DO-160E, Section 6	Data integrity	
Operational Shocks	RTCA DO-160E, Section 7	Data integrity	
Vibration	RTCA DO-160E, Section 8	Data integrity	
Magnetic Effect	RTCA DO-160E, Section 15	Data integrity	
Flammability	14 CFR, Section 25.853(a)	Flammability per CFR limits	

*Additional Environmental Testing\**

Exposure	Method	Exposure Temperature (°C)	Exposure Duration (hr)	Power Effectiveness Pass/Fail*	Data Integrity Pass/Fail*	Adhesion*	Print Durability
Skydrol LD4	Immersion	70	24				
	Brush Daily	70	24				
MEK	Brush Daily	23	24				
Kerosene	Brush Daily	40	24				
	Immersion	40	24				
Isopropyl Alcohol	Brush Daily	23	24				
	Immersion	23	24				
Ethanol	Brush Daily	23	24				
	Immersion	23	24				
Formula 409	Brush Daily	23	24				
	Immersion	23	24				
2% Permethrin	Brush Daily	23	24				
	Immersion	23	24				
MIL-PRF-7808	Brush Daily	70	24				
Alpine RF-11	Brush Daily	50	24				
Cryotech Polar Guard Advance Type IV	Brush Daily	50	24				
	Immersion	70	24				
Deionized Water	Immersion	70	24				
Corrosion	5% Salt Spray	23	50				

\*Results dependent on conditions used for testing, actual performance will vary depending on environment and substrate composition. See *Environmental Testing Methodology* for additional detail.

*Environmental Testing Methodology*

RF Performance, adhesion, and visual defects were evaluated. PET and polycarbonate test panels were used for immersion and brush testing. Polycarbonate, PET, or PEEK test panels were used for environmental exposures. The initial samples were adhered to test panels, random bits were encoded to the user memory, and then tested for average minimum transmitted power between 800 and 1000 MHz. RF performance was evaluated in terms of power effectiveness. Power effectiveness of greater than 50% in comparison to the initial measurement earned a passing grade. Data integrity was evaluated by reading the user memory after exposure. A passing grade was given to samples with no observed change to the user memory. Adhesion values were an average of a sample set. Adhesions of unexposed samples were used as controls. Adhesion performance was calculated as percentage difference of exposed samples to control sample adhesion. Samples with average adhesion above 9.5 N/25 mm to stainless steel earned a passing grade.

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.

SAE: Society of Automotive Engineers

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

RTCA DO-160E: Environmental Conditions and Test Procedures for Airborne Equipment

CFR: Code of Federal Regulations (U.S.A.)

FAA TSO: Federal Aviation Administration Technical Standard Orders (U.S.A.)

**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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## Technical Data Sheet

Product compliance information is based upon information provided by suppliers of the raw materials used by Brady to manufacture this product or based on results of testing using recognized analytical methods performed by a third party, independent laboratory. As such, Brady makes no independent representations or warranties, express or implied, and assumes no liability in connection with the use of this information.

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

### 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.