Technical Data Sheet

Brady B-1010 On-Metal Rigid RFID Tag

TDS No. B-1010
Effective Date: 10/06/2017

Description

Brady On-Metal Rigid RFID Tags incorporate extended temperature range chip technology with durable label materials to withstand challenging environments on metal surfaces.

Print Technology
None: No printing
Material Type
Solid Epoxy
Adhesive
Acrylic-Rubber Hybrid
Shelf Life
2 years
User Memory
Dual-Record Memory: 2 kbits
Multi-Record Memory: 64 kbits
EPC Bank
Up to 496-bit EPC identifier
TID Bank
256 bits
Regulatory
ATA Spec 2000 Ch 9 Rev 2016.1
SAE AS5678 2006-12
Label Dimensions

Units	English			Metric (mm)		
Catalog Number	Width (in)	Length (in)	Thickness (mil)	Width	Length	Thickness
RGD-LM-STK-1010-RFID	1.4	0.3	0.2	36.4	7.0	4.4
RGD-LM-NKL-1010-RFID	0.6	0.6	0.2	14.0	14.0	5.8
RGD-HM-TYL-1010-RFID	0.6	0.4	0.2	14.0	9.0	5.3

Thickness is measured at the center of the tag over the epoxy bump which is 16 mils tall (0.4 mm).

Label Mass

Catalog Number	Label Mass (g)
RGD-LM-STK-1010-RFID	1.9
RGD-LM-NKL-1010-RFID	2.0
RGD-HM-TYL-1010-RFID	1.2

Approximate Read Range

Catalog Number	Surface	Average Read Range (m)*
RGD-LM-STK-1010-RFID	Aluminum	2.92
RGD-LM-NKL-1010-RFID	Aluminum	1.91
RGD-HM-TYL-1010-RFID	Aluminum	0.92

*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**

Tag Size	STK		NKL		TYL	
Surface	ETSI Average (m)	ETSI Average (m)	ETSI Average (m)	FCC Average (m)	ETSI Average (m)	FCC Average (m)
Aluminum	3.97	1.73	1.73	1.94	0.74	1.08
Stainless Steel (CRES)	3.84	1.58	1.58	1.89	0.72	1.08
Titanium	3.77	1.67	1.67	1.91	0.69	1.16
Fiberglass electrical grade	0.98	1.14	1.14	1.02	0.60	0.31
PEEK Composite	4.22	1.87	1.87	2.15	0.88	1.05
PPS Composite	3.84	1.73	1.73	1.92	0.80	0.92

*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.

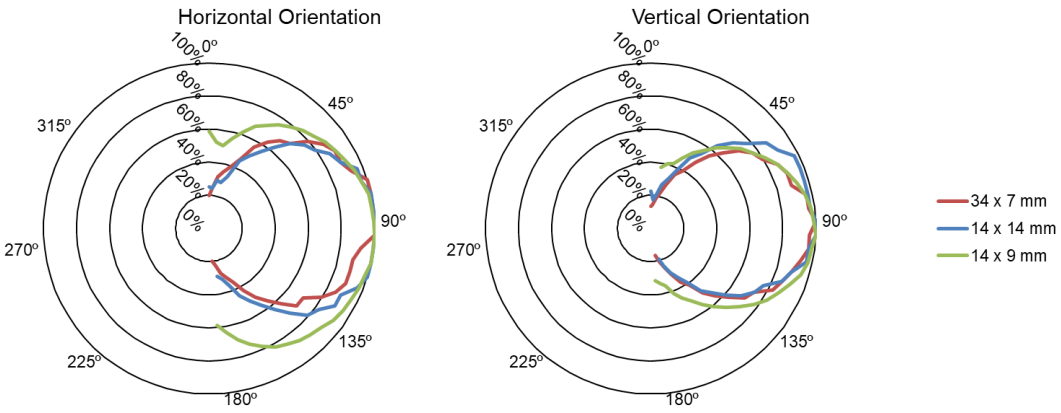
Surface Adhesion

Material	Peel Average (N/25mm)	Peel Average (oz/in)
CRES	20.3	74.4
Aluminum with interior TC	15.7	57.6
PEEK Composite	15.5	56.9
PPS Composite	14.4	53.0
Fiberglass A13RG2W	14.8	54.4
Titanium	12.9	47.2

Adhesion values reported were an average of a sample set.

Orientation

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 measurements was 1 m for all tags. EU read range was measured at 866 MHz and US read range was measured at 905 MHz. Surfaces tested were 0.062" thick. US measurements were adjusted by +11% to account for US antenna power. Results will vary in different application environments.

Environmental Testing

The Brady On-Metal Rigid RFID Tag is AS5678 2006-12 compliant for the following environmental tests.

AS5678 Environmental Compliance

Environmental Requirement*	Environmental Test Reference Document	Performance Standard	Pass/Fail
Operating temperature	RTCA DO-160E, Section 4	Data integrity	Pass
Survival temperature	RTCA DO-160E, Section 4	Data integrity	Pass
Altitude test	RTCA DO-160E, Section 4	Data integrity	Pass
Decompression test	RTCA DO-160E, Section 4	Data integrity	Pass
Over pressure test	RTCA DO-160E, Section 4	Data integrity	Pass
Humidity	RTCA DO-160E, Section 6	Data integrity	Pass
Operational shocks	RTCA DO-160E, Section 7	Data integrity	Pass
Vibration	RTCA DO-160E, Section 8	Data integrity	Pass
Magnetic Effect	RTCA DO-160E, Section 15	Data integrity	Pass
Flammability	CFR, Section 25.853(a)	Flammability per CFR limits	Pass

AS5678 Fluid Susceptibility

The Brady On-metal Rigid RFID Tag was exposed is compliant with the following fluids as tested per AS5678 standards using DO-160E Section 11.

Exposure	Method	Power effectiveness Pass/Fail*	Data Integrity Pass/Fail*
Skydrol LD4	Immerse	Pass	Pass
Skydrol LD4	Brush	Pass	Pass
Kerosene	Immerse	Pass	Pass
Kerosene	Brush	Pass	Pass
Petroleum Oil	Immerse	Pass	Pass
Petroleum Oil	Brush	Pass	Pass
Syntheic Oil	Immerse	Pass	Pass
Synthetic Oil	Brush	Pass	Pass
Alpine RF-11	Brush	Pass	Pass
Cryotech Polar Guard	Immerse	Pass	Pass
Cryotech Polar Guard	Brush	Pass	Pass
DI Water	Immerse	Pass	Pass
FE36	Brush	Pass	Pass
MEK	Brush	Pass	Pass
MIL 7808 Oil	Brush	Pass	Pass
Aeroshell Grease	Brush	Pass	Pass
IPA	Brush	Pass	Pass

*Additional Environmental Testing**

Exposure	Exposure Temperature(°C)	Exposure Duration (hr)	Method	Power effectiveness Pass/Fail*	Data Integrity Pass/Fail*	Adhesion*
Skydrol LD4 Immerse	23	336	Immerse	Pass	Pass	Pass
Skydrol LD4 Brush	70	1000	Brush Daily	Pass	Pass	Pass
Kerosene	23	500	Brush Daily	Pass	Pass	Pass
Mil 7808 Oil	70	500	Brush Daily	Pass	Pass	Pass
IPA	23	500	Brush Daily	Pass	Pass	Pass
MEK	23	500	Brush Daily	Pass	Pass	Pass
Alpine RF-11	23	500	Brush Daily	Pass	Pass	Pass
Cryotech Polar Guard Advance Type IV	23	500	Immerse	Pass	Pass	Pass
Aeroshell Grease 33	70	24	Brush Once	Pass	Pass	Pass
Fire Extinguisher FE36	23	24	Brush Daily	Pass	Pass	Pass
Corrosion	23	96	5% Salt Spray	Pass	Pass	Pass
Humidity Cycling (External)	30°C – 55°C	18, 6 cycles (108 total)	95% Humidity, Cycle Temp	STK & NKL Pass TYL Fail	Pass	Pass
Humidity Cycling (Internal)	30°C – 50°C	18, 2 cycles (48 total)	95% Humidity, Cycle Temp	Pass	Pass	Pass
Waterproofness	23	0.25	DO-160E, Section 10	Pass	Pass	Not Applicable

*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. Aluminum test panels were used for immersion testing, brush testing, and environmental exposures. Initial samples were adhered to test panels and tested for average minimum transmitted power (MTP) between 860 and 930 MHz. Initial samples were written with random bits and recorded. RF performance was evaluated in terms of power effectiveness. Power effectiveness of greater than 50% in comparison to a control earned a passing grade. 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.

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.
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