

Earth Bonding Carbon Fibre Composite



Introduction

The Glenair Earth Bonding system was first introduced to the Rail and Mass Transit industry for creating a secure electrical grounding system permitting passage of high current in case of electrical short circuit. The method of achieving electrical connection requiring no heat, cleaning or impact. Only a drilled hole to the required diameter and connection using a light-weight, hand hydraulic setting tool. The first requirements were for electrical grounding to steel or stainless steel materials followed by the need for grounding connections to aluminium. For steel the interface between the earth bond and grounding plate is via a tin plated copper bush and where aluminium is used the bush is manufactured from nickel-plated aluminium. As the requirement for weight reduction continues to grow and carbon fibre materials replace steel and aluminium the need to

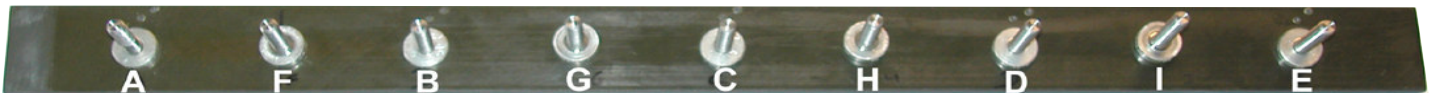
secure grounding remains paramount.

The following electrical and mechanical values were achieved using carbon fibre plate 4.3mm thick with tin plated copper earth bonds.

Providing:

- **Low electrical resistance**
- **High torque rotation**
- **High mechanical strength**

Compared to current methods of attaching connections to carbon fibre materials to achieve an electrical grounding point you may consider Glenair as an alternative solution.



Distance between sequentially lettered bonds = 100mm

Electrical Resistance Tests, 5 Amp Current

Earth Bond Cu M6 Ø8,5

	A	B	C	D	E
A	x	91.4mΩ	163.1 mΩ	200.4 mΩ	269.4 mΩ
B	x	x	111.0 mΩ	154.7 mΩ	224.9 mΩ
C	x	x	x	122.3 mΩ	201.3 mΩ
D	x	x	x	x	151.2 mΩ
E	x	x	x	x	x

- Resistance of Composite Material (average over 100mm excluding bond resistance): 53.9mΩ
- Earth Bond Resistance (average): 37.9mΩ

Earth Bond Cu M6 Ø11,5

	F	G	H	I
F	x	73.9 mΩ	127.6 mΩ	180.6 mΩ
G	x	x	81.3 mΩ	140.8 mΩ
H	x	x	x	90.2 mΩ
I	x	x	x	x

- Resistance of Composite Material (average over 100mm excluding bond resistance): 48.7mΩ
- Earth Bond Resistance (average): 14.4mΩ

Tensile Test

Earth Bond C:	180 daN
Earth Bond D:	280 daN
Earth Bond E:	280 daN
Earth Bond H:	620 daN
Earth Bond G:	450 daN



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