

HIGH PERFORMANCE BUSBARS

BUSBAR SOLUTIONS FOR MILITARY AND COMMERCIAL AEROSPACE SYSTEMS

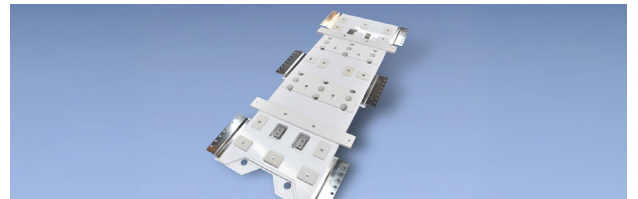
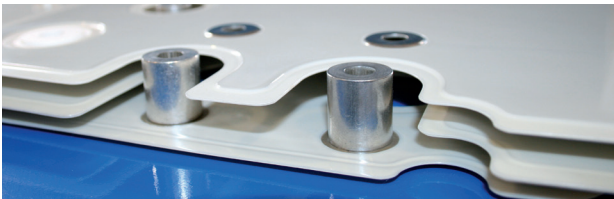
PDS - 388



Amphenol Busbars are engineered for high current density, thermal efficiency, and harsh environments.

Amphenol Commercial Air Busbars offer a superior alternative to traditional wire and cable assemblies for power distribution in high-performance electrical systems. By providing a direct, low-impedance current path, busbars reduce voltage drop, improve electrical efficiency, and support higher current loads within a compact footprint. Their rigid or flexible constructions can be tailored to fit complex installation requirements, enabling optimized routing and seamless integration into equipment designs.

Busbars also improve thermal management by distributing heat more effectively than conventional cabling, helping to enhance overall system performance and longevity. Utilizing high-quality conductive materials and robust insulation systems, busbars deliver exceptional durability in environments subject to vibration, shock, moisture, and temperature extremes. The result is a lightweight, space-efficient, and highly reliable power distribution solution that reduces assembly complexity while supporting the growing power demands of modern aerospace, and defense electrification applications.



FEATURES & BENEFITS:



Powder-Coated Busbars

- Multiple off-the-shelf powder coating formulations available depending on performance needs
- Good fluid resistance
- High voltage capable
- Limited tooling required depending on geometry
- Low upfront cost/shorter lead times
- Best for prototype situations



Laminated Busbars

- Range of lamination materials for different temperature requirements, fluids, etc.
- Best performing at high voltages and altitude, including partial discharge mitigation
- Shielded busbars possible with this laminated technology
- Tooling required for laminating as well as forming



Flexible Busbars

- Designed to accommodate tolerance stackups and improve routing
- Typically copper with a range of insulations for various performance levels
- Variable flexibility and pre-form geometries available
- Limited tooling required depending on design



Over-molded Busbars

- Typically molded rubber, excellent sealing to surface of conductor
- Can be designed with integral sealing feature and insulated fasteners
- Very good high voltage performance at altitude
- Tooling required for molding process as well as forming

BUSBAR CONSTRUCTION

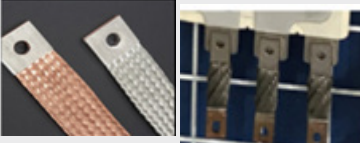
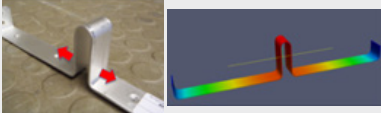
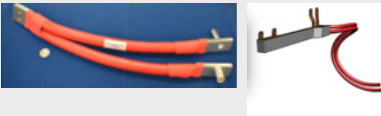
Relevant physical properties of conductor materials used in busbar construction

Metal	Density @ 20°C (lb/in3)	CTE @ 20°C (x10-6m/mv•°C)	Thermal Coefficient @ 20°C (W/m•K)	Specification
Copper 110	0.323	17	388	ASTM B-152 QQ-C-576
Copper 101	0.323	17	383-391	ASTM B-152 QQ-C-576
Brass 260	308	19.9	120	ASTM B-36 QQ-B-613
Aluminum 6061-T651	00.098	23.6	154	ASTM-B236

Relevant electrical properties of conductor materials used in busbar construction

Metal	Resistivity (p) @ 20°C Ω • sqmil/ft	Conductivity % IACS @ 20°C	Thermal Coefficient of Resistivity (a) @ 20°C (10 2/°C)
Copper 110	8.1	101	.393
Copper 101	8.1	101	.393
Brass 260	290.06	28	00.098
Aluminum 6061-T651	13.35	62	.423

BUSBAR CONSTRUCTION: FLEXIBLE INTERCONNECT

Solutions	Pictures	Maximum conductor dimensions (thickness &/ or width)	Insulation	Flexibility	Stress on components	Advantages
Braid Busbars		Max cross-section: 240mm ²	In option	3 axes	+++	Can be part of a laminated busbar system Cost Flexibility (3 axes)
UltraFlexible Busbars		Standard 0.8mm per layer (thicker conductors are also possible) Possibility to stack several layers	In option	2 axes Up to 3 axes depending on the design	+	Minimum stress on external components Position gravity independant, easy integration and better security
Thin insulated copper conductors (film)		Standard: 0.8mm per layer (thicker conductors are possible) Possibility to stack several layers	Yes	2 axes Up to 3 axes depending on the design	++	Capability to combine conductors with different polarities
Press-welded busbar used as flex-tab connection		Max width: 100mm Max thickness: 10mm	In option	2 axes	+++	Can be part of a laminated busbar system High current
Ultra-flexible cable combined with PowerLug technology		Custom development Max cross-section: 240mm ²	Yes	3 axes	++ (depends on the cross-section)	Design flexibility Possibility to integrate locking system Can be used in high-humidity environments

BUSBAR CONSTRUCTION: LAMINATION

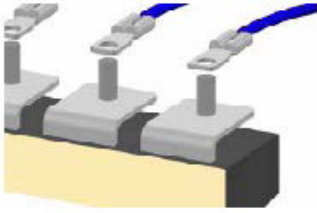
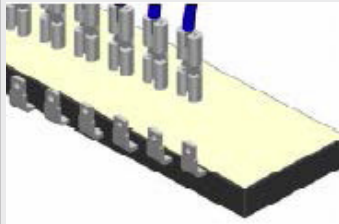
Insulation Material Choice

Material	Cost	Colors	Properties	Temp. Index	Notes
Mylar	Low	Clear White	UL 94V-2 Coating	105°C	External Insulation Abrasion Resistant
Nomex	Medium	Off White Tan	UL 94V-0 Polyamide Paper	220°C	Internal Insulation High Dielectric Strength
FR1 Valox	Medium	Off White	UL 94V-0 UL 94V-0TMO	125°C	Easy to Fabricate High Dielectric
Kapton	Very High	Yellow Red	UL 94V-0 Film	240°C	High Dielectric
FR4/Phenolic	Medium	Tan Green	UL 94V-0	125°C/ 105°C	High Voltages Edge Protection
Epoxy Embedding	Medium	Black White Amber	UL 94V-0	150°C	Edge Protection
Powder Coating	Low	Many	UL 94V-0	125°C	Complex Shapes, Holes and Edges

BUSBAR CONSTRUCTION: PLATING

Metal	Conductivity	Thermal Coefficient of Resistivity (α) @20°C (10 ⁻² /°C)	Specification
Tin	13.6	.42	ASTM B545, MIL-T-10727
Nickel	11.8	.48	AMS 2403, AMS- QQ-N-290, QQ-N-290
Silver	105.8	.38	ASTM B700
Solder Alloy 60/40	10	.40	AMS-P-81728, MIL-P-81728

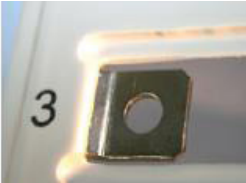
BUSBAR CONSTRUCTION: LAMINATION

			
Tabs	Studs	PEM	Fastons
			
PCB	Connectors	RADSOK®	Pins

BUSBAR CONSTRUCTION: TERMINATIONS

	Floating spacer for optimal mechanical tolerance		Standard spacer for easy leveling		Standoff spacer with stud for easy level and connection (cable show, resistor...)
	Double spacer for easy leveling and connecting on both sides (snubber)		Tapped spacer for leveling up connecting point		Compliance to standards for worldwide use
	Captive screw for easy and secure mounting		Threaded insert for fast connecting		Casted link for reducing impedance and cost

BUSBAR CONSTRUCTION: TERMINATIONS

	Serted stud for universal bolted connection		Fast-On® tab		Wire terminal for bare wire connection
	Double bending tab for deep and cost effective leveling		Extra cross- section for localized ampacity reinforcement		Pass-through connection
	Thick insulant closing for deep and limited area		Semi rigid embossment for less constraints		Integrated barrier for increased creeping distance
			Embossment for cost effective leveling		

