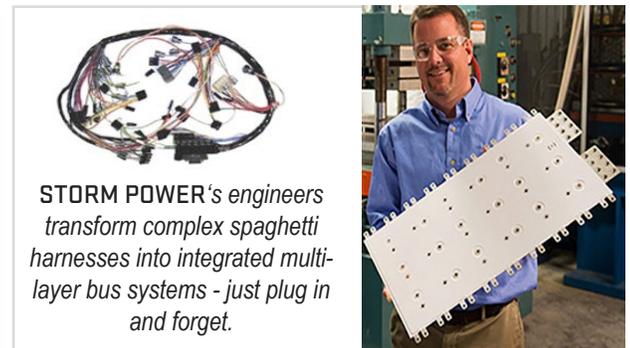


MULTI-LAYER LAMINATED BUS BAR

LAMINATED BUS BAR

reduce inductance by alternating the positive and negative bus bar layers between multi-conducting layers of thin dielectric insulation. Multi conductor connectors of all makes and sizes, including IGBTs and capacitors, are connected to the structure. Inductance is reduced, electromagnetic interference is eliminated, and systems switch faster and cleaner, with less energy loss.



STORM POWER's engineers transform complex spaghetti harnesses into integrated multi-layer bus systems - just plug in and forget.

INDUCTANCE, CAPACITANCE, and IMPEDANCE in LAMINATED BUS ASSEMBLIES

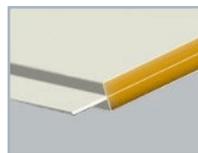
Advantages of laminated bus products are to locate, shape, and route conducting points in a way that ensures the multi-layered current can flow in opposite directions and in equal strength. The key aspect of this design concept, is to generate opposing voltages proportional to the rate of current change in a circuit, which in-turn, enables the opposing magnetic fields to cancel each other's ticket. This eliminates a free ride for extra inductance.

EDGE FILL OFFERED BY STORM POWER COMPONENTS:



OPEN EDGE - Lamination extends beyond conductor farther than pinched or epoxy filled edges, and uses less tooling, which:

- lowers costs
- maintains minimal creepage
- has less robust edges



PINCH SEAL EDGE - Lamination extends past conductor with 100% sealed edges that:

- is good for harsh environments
- is limited by the thickness and number of conductors



EPOXY FILLED EDGE - Lamination extends less than other options to reduce footprint and:

- edges are 100% epoxy sealed by hand
- are good for harsh environments





MULTI-LAYER LAMINATED BUS...(CON'T)

INDUSTRIES AND APPLICATIONS

INDUSTRIAL

Motor drives
 Motor controls
 Welding
 Elevator systems
 Switch gear
 HVAC

COMPUTERS

Mainframes
 Servers
 Cabinet power

MEDICAL

CAT scan
 MRI

POWER CONVERSION

Power supplies
 UPS systems
 Alternative energy
 Inverters

TRANSPORTATION

Hybrid vehicles
 Electric vehicles
 Rail
 Shipboard
 Heavy equipment

TELECOMMUNICATIONS

Routers
 Backplanes
 Switches
 Cellular base stations
 Battery back-up

DESIGN CONSIDERATIONS

With the guidance from our Lamination Center team, engineers can be confident that they will make the right choice of insulating material and conductor (raw or plated) thickness. You will be able to explore design considerations from material to edge seals.

TESTING CRITERIA



A hi-pot test is performed to make sure the finished coating has no defects, such as pin holes, voids, or thin areas near sharp corners or edges.



All surfaces are scanned at twice the operating voltage plus 1,000 volts as standard procedure, unless otherwise specified.



Storm Power Components also offers insulation resistance testing (leakage current) and partial discharge testing at our facility.

LAMINATED BUS BAR - Insulation Materials Table

Selection of the proper internal dielectric insulations can depend on capacitance, inductance, voltage potentials, and operating environment. The following table lists the most common insulating materials. *

Insulation Materials	Continuous Use Temp. C°	Dielectric Constant ASTM D150	Dielectric Strength ASTM D149	Flammability Rating
Epoxy Glass (FR4) Superior mechanical and dimensional stability properties	140°C	4.3	1250	UL 94 V-0
Mylar (PET) Cost effective; tear, chemical, and moisture resistant	105°C	3.3	3500	UL 94 VTM-0
Tedlar (PVF) Chemical/solvent resistant; good mechanical properties	105°C	11.0	3500	UL 94 HB
Teonex (PEN) Higher dielectric strength and continuous use temperature	160°C	3.4	5000	UL 94 VTM-0
Nomex Flame resistant; durable	220°C	1.6	430-845	UL 94 V-0
Kapton High temperature rating and range stability	200°C	3.7	5000	UL 94 VTM-0
Epoxy Powder Coating Flame, moisture resistant; ideal for multiple shapes	130°C	4.0	800	UL 94 V-0

* Note: Values may vary based on application



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