

Laminated Bus Bars



Fields of Application

Etronics is offering innovative solutions to customers in different field.

Renewable Energy



Facts for grid connection
of wind farms

Busbars for :

- ✓ Wind converters
- ✓ Solar converters
- ✓ Other renewable energy system

Power T&D



Power capacitors and FACTS
for Power T&D

Busbars for :

- ✓ HVDC converters

Telecom



Busbars for :

- ✓ Mobile communications base stations

Fields of Application

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Electric Railways



FACTS and Power capacitors for railways electrification.

Busbars for :

- ✓ Traction
- ✓ Auxiliary converters

Industry



Rectifiers for high power DC supply

FACTS & Capacitors for :

- ✓ Power quality
- ✓ Power factor correction

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Multi-connector Bus Bars for Power Electronics

The advanced generation of high power electronics (especially IGBT technique) has generated a high demand on power distribution solutions and thus also on the design engineer of bus bars. Minimal voltage drop, high currents, low inductivity and high capacity coupling between the conductors are some of the critical parameters which are needed for effective Multi-connector Bus Bar systems.



Therefore has developed – together with a major customer – a system of cost effective high performance bus bars – called MBB (Multi-connector Bus Bar) which meet the requirements of any low and mid voltage application (up to 1100 VAC).

- **Electrical Advantages**

Low voltage drop, high noise suppression, low inductivity, high capacitive coupling between the layers, low impedance, high shielding, high current carrying capacity.

- **Mechanical Advantages**

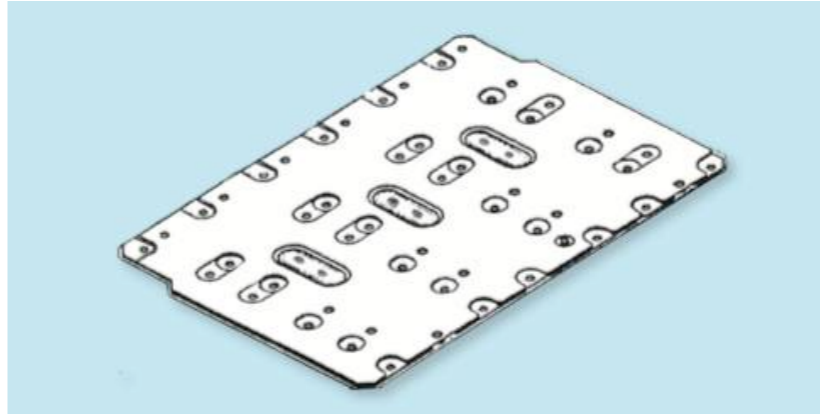
High packaging density, low profile design, low weight, high mechanical strength, modular design, shallow or deep drawn contact surfaces accommodates planar mounting surfaces for IGBT's or Capacitors, high temperature stability, stable platform, improved thermal properties due to very good temperature distribution, error free installation.

- **Economic Advantages**

Low system costs, low service costs, low installation costs, high quality standard due to high reliability.



Material Data for Multi-connector Bus Bar Installation Materials

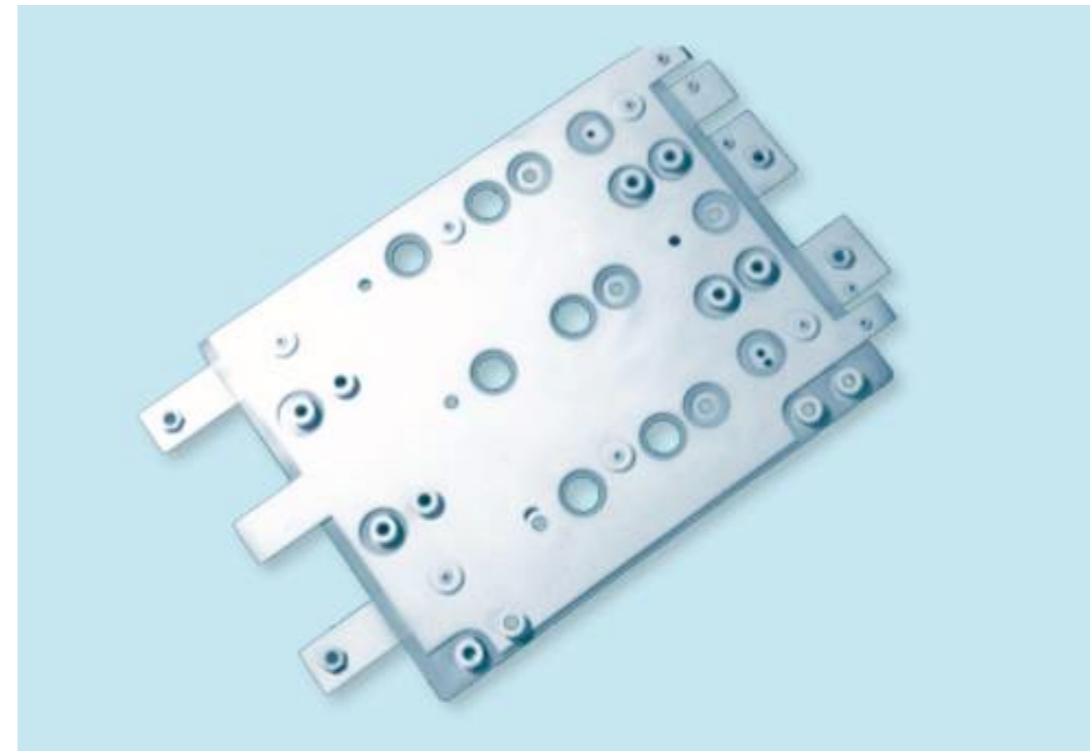


- Multi-connector Bus Bars can be manufactured in many sizes and shapes, flat or even three dimensional, with up to 5 layers of conductors. The size and finish of the conductors, the type and number of terminals - threaded inserts, connector blocks, quick connectors or shallow or deep drawn contact surfaces as well as different types of dielectric materials can be designed specifically to the demand of the customer. Creepage clearances between conductive surfaces can be increased with valleys or walls to meet the necessary requirements.
- Multi-connector Bus Bars provide an easy design for structured power distribution compared to error prone wire harness. Rectangular conductors also offer a higher current carrying capacity than round wires. Due to the low inductance Bus Bars are preferable for connections between Insulated Gate Bipolar Transistor (IGBT) module and DC capacitor banks.
- Finished assemblies - glued together with special glue or produced in a laminated version are verified dimensionally and mounted together precisely. The accurate terminations and overlays provide an error free customer assembly where active and passive components can be integrated to a complete power distribution subsystem.

Material Type	Relative Permittivity	(kV/mm) Dielectric Strength	Dissipation Factor	CTI	(ohm.cm) Volume resistivity	(°C) Tmin	(°C) Tmax
PolyCarbonate-PC	2,9	50	0,01	300	1,00E+ 017		100
PolyPropylene-PP	2,3	85	0,0019	600	4,00E+ 015		115
Polyamide-PI	3,5	280	0,005	300	1,00E+ 016		180
Fluorinated ethylene propylene - FEP		240	0,0003	600	2,00E+ 016	-70	200
Polyethylene terphthalate - PET	3,3	90	0,003	400	1,00E+ 015		125
Polyvinyl Flouride - PVF	5	17,5	0,003	500	1,00E+ 016	-70	125
Polytetraflouroethylene	2	165,4	0,009	600	1,00E+ 016	-188	260
Polyetgetherimide - PEI	3,2	143,7	0,005	500	2,5E+ 015		180

Material Data for Multi-connector Bus Bar Installation Materials

- Multi-connector Bus Bars consists of several layers of conductors insulated by thin layers of Polycarbonate or other special insulation materials (depending on the application). Pure copper - tin or nickel plated - is the most widely used bus bar material. Aluminum is used when weight is a factor but its conductivity is only 60% that of copper. Other materials which can be used are brass and beryllium copper.

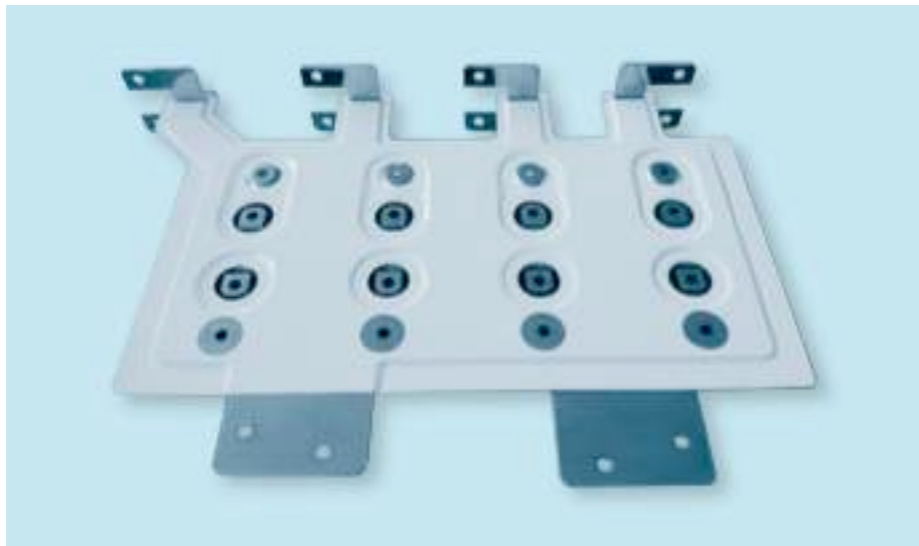


Description	Electrical Conductance (s.m/mm ²)	Specific Weight (gr/cm ²)
Copper (Ecu F30)	56	8,95
Aluminum	36	2,70
Brass	15	8,1-8,7
Be-Bronce	22-30	8,26

Material Data for Multi-connector Bus Bar Installation Materials

- Current distribution in modern power supplies and digital systems request the design engineer to eliminate bulky wires. Well designed bus bars can reduce significant space and installation time.

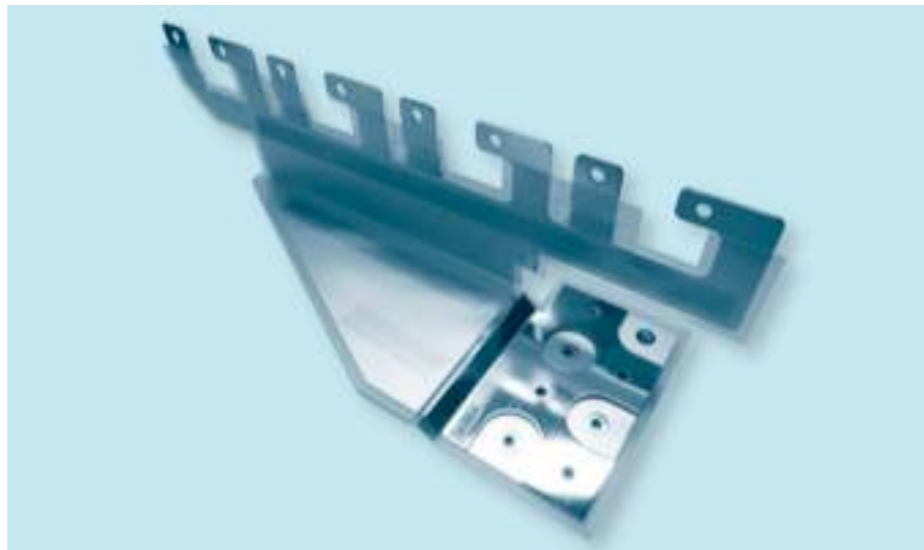
Multi-connector Laminated Bus Bar, MLBB



Multi-connector Bus bar, glued together with Special glue. MBB



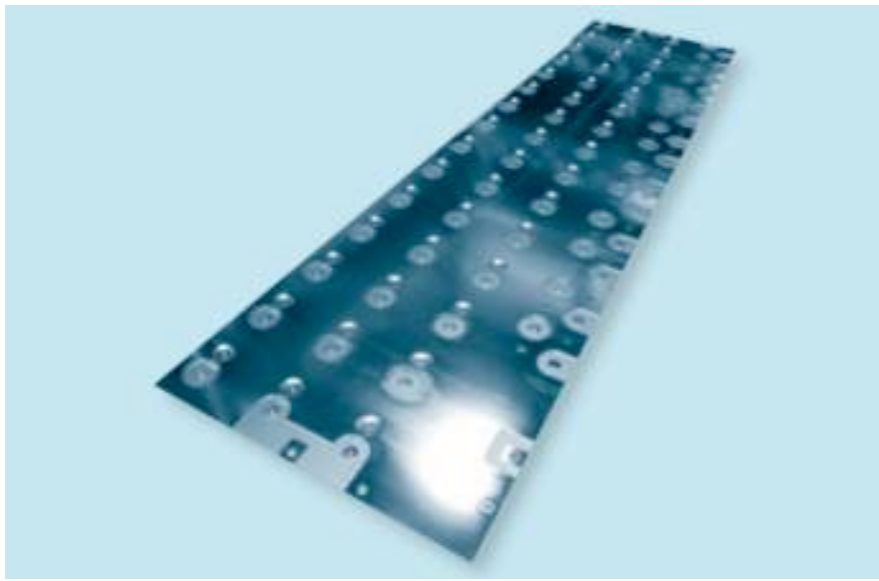
MLBB are available for individual geometrical option



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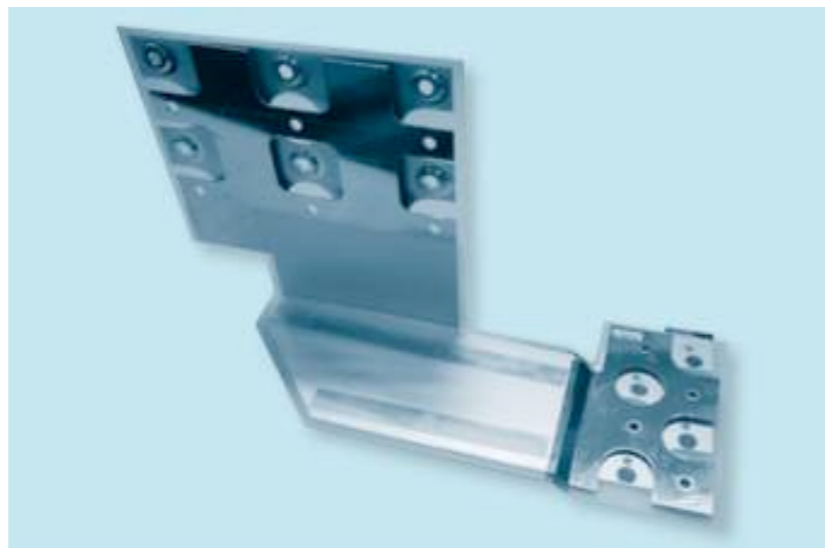
Multi-connector Bus Bar, MBB with exceptional dimensions.



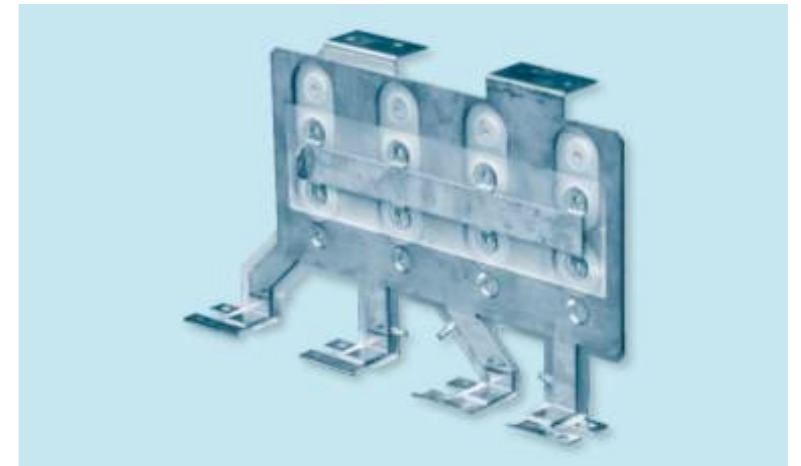
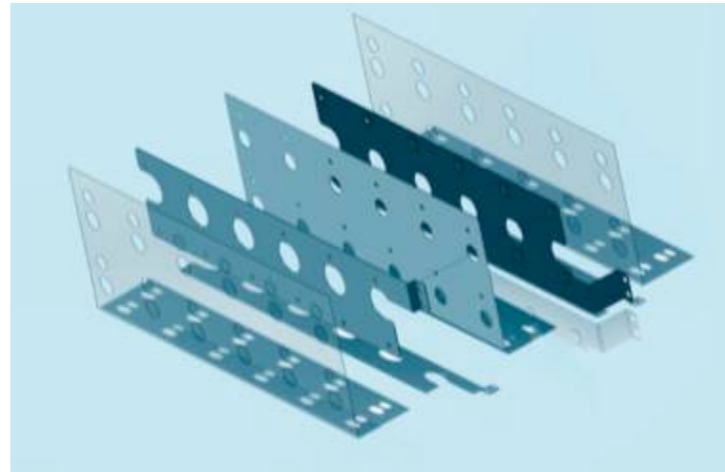
Multi-connector Laminated Bus Bar, MLBB produced with special foils to achieve a robust and close assembly



Multi-connector Bus Bar, MBB



Multi-connector Bus Bar systems offer elegant solutions for manufacturers of sophisticated electronic equipment. **MBB's** are manufactured with CNC programmed cutting and punching machines. Tin plating protects the copper from corrosion and provides reliable electrical connections. The dielectric films used for insulation provide high dielectric strength and can be chosen to tailor the capacitance and impedance. Multiple conductors and connectors can be housed into the assembly. Finished assemblies are verified dimensionally and electrically to the customer's request. Design is always optimized for compact, efficient current distribution. Nearly unlimited package sizes are possible.





Etronics Sarl

8, rue de Témara
z.a. du bel-air
F-78108 St. Germain-en Laye
FRANCE
Phone: (+33) 1.39.10.29.00
Mail: sales@etronics.fr