EAE
ELEKTRİK

E-LAM

Laminated Busbar Solutions

www.eaeelectric.com

EAE GROUP IN NUMBERS

Since 1973

EAE Group of Companies started its journey in the electrical sector in 1973 with the establishment of EAE Elektrik. Since its founding, EAE has grown rapidly, expanding its production and areas of operation by incorporating EAE Lighting in 1983, EAE Machinery in 1996, EAE Electrotechnics in 2004, and EAE Technology in 2009.

EAE carries out its production activities in accordance with ISO 9001 Quality Management, ISO 14001 Environmental Management, ISO 14064-1 Greenhouse Gas Management System, ISO 45001 Occupational Health and Safety Management, ISO 10002 Customer Satisfaction Management, ISO 50001 Energy Management System, and ISO 27001 Information Security Management System standards.

50+
Years Experience

7
Active Factories

360.000m²
Enclosed Space

3
R&D Centers

150+
Countries Exported To

E-LAM

What is Laminated Busbar?

E-LAM Laminated Busbar is a multi-layer construction of conductors: it is formed by laminating copper or aluminum conductors separated by thin dielectric materials into a single structure. Laminated Busbar systems are a custom-design, superior power distribution method designed for today's electrical and electronic systems that handle thousands of amperes. Laminated Busbars offer ease of assembly with their customizable structure and compact design, providing a durable structure. Furthermore, they bring reliable and modular solutions that you need in various fields.

Advantages

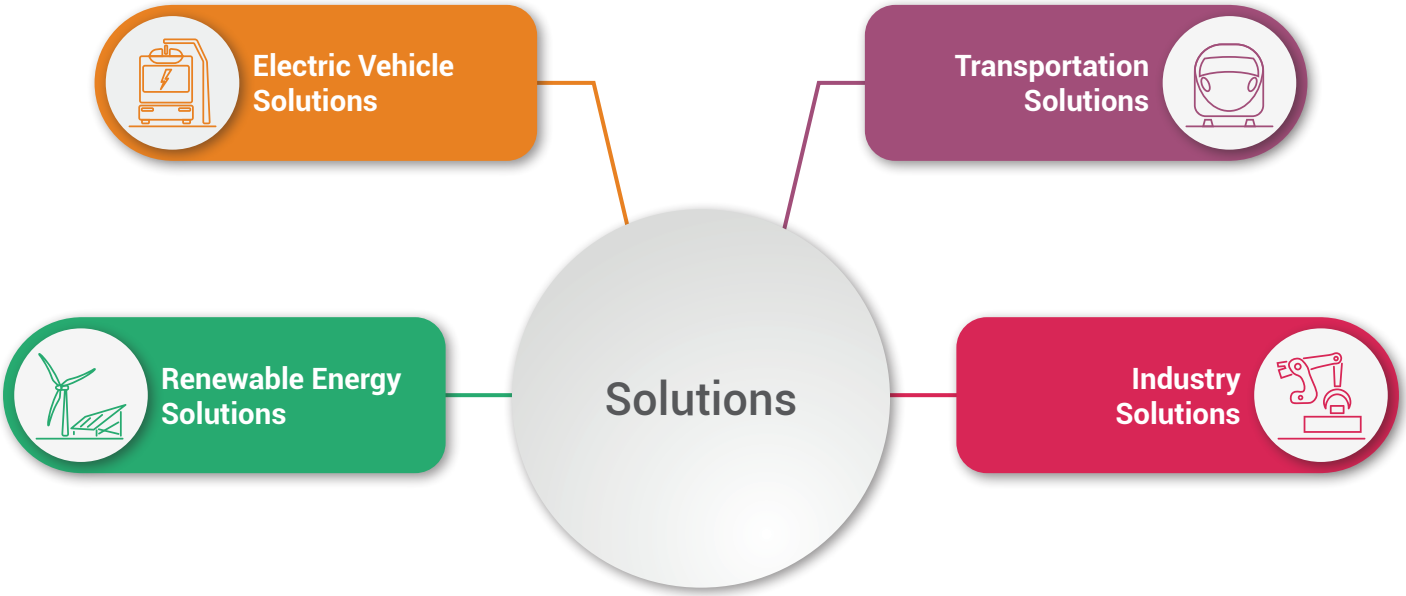
E-LAM Laminated Busbar Systems offer better electrical and mechanical performance when compared to traditional power distribution cabling systems, especially cable bundles.

Advantages of Laminated Busbar;

- High Current Carrying Capacity
- High Electrical Insulation
- High Short Circuit Resistance
- Low Inductance Values
- High Capacitance Values
- Modular Structure and Compact Design
- Wide range of uses
- Reliable Structure
- Reducing Assembly Time
- Low Switching Losses
- Thermal Performance

E-LAM Laminated Busbar Solutions

E-LAM Laminated Busbar Solutions are custom-produced to suit the specific application area, systems, and customer preferences. It is designed by experienced engineers to have low resistance and inductance values and high current carrying capacity as a result of optimization work.



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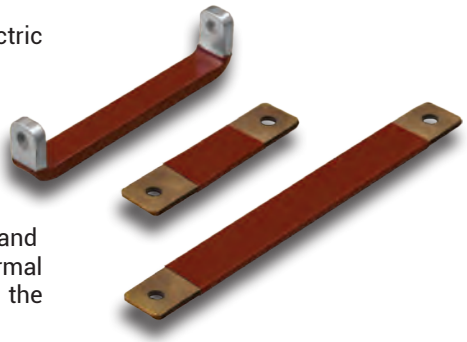
Electric Vehicle Solutions

Advanced laminated busbar technology increases the performance of your electric vehicle.



Provides thermal, mechanical and electrical protection for your electric vehicle. **E-LAM** Laminated Busbar systems are based on powerful electric motor drivers, large capacity battery groups, power inverters, reliability and high performance in the efficient distribution of power from the charging source to the battery and throughout the vehicle. It provides optimum power transfer, reduces energy loss and increases overall system efficiency. With its compact design and excellent thermal management, the laminated busbar provides advanced heat dissipation, ensuring the highest performance and safe operation of your electric vehicle.

Applications:

- Battery Module and Package Connections
- DC/DC, AC/DC Converters
- Powertrain
- Energy Transmission to the Internal Parts of Electric Vehicles (Air conditioning, panels, headlights, music systems, etc.)

Transportation Solutions

E-LAM brings unique advantages when it comes to operating and protecting the electric powertrain and power storage systems in railway vehicles.

E-LAM best meets the needs of the electric and hybrid transportation market in power management solutions of customer-specific designs.

Applications:

- Battery Module and Package Connections
- DC/DC, AC/DC Converters
- Powertrain
- Motor Drives

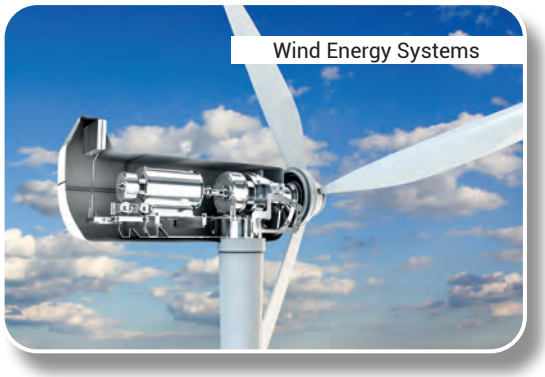
Renewable Energy Solutions

E-LAM Laminated Busbar offers the safest and most optimized solutions for your renewable energy systems, taking into account technical requirements, environmental conditions and physical factors. As the renewable energy sector evolves, Laminated Busbar offers a robust and reliable solution for power transmission in solar, wind and other sustainable energy systems.

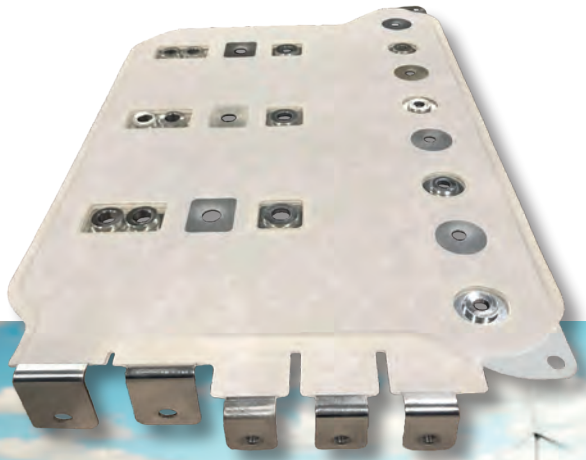
Consisting of multiple conductive layers laminated with insulating materials, busbars minimize electrical losses for maximum energy and provide enhanced thermal advantage.

Their compact and customizable design enables seamless integration into a variety of renewable energy installations, enabling energy distribution. It increases the reliability and productivity of your renewable energy infrastructure, making a significant impact in your quest for sustainability.

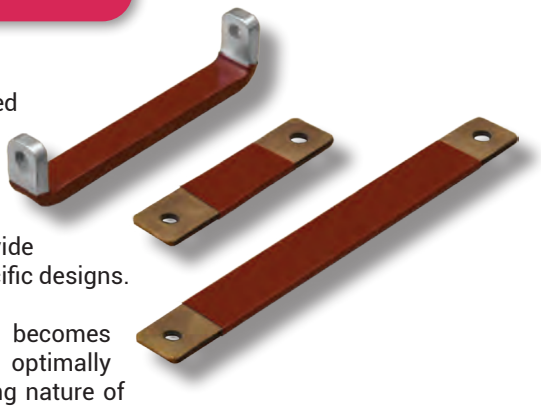

Solar Energy Systems


Wind Energy Systems

Energy Storage Centers



Industry Solutions

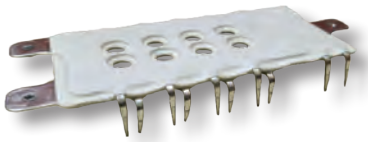


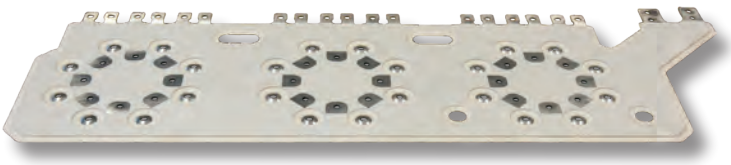
Industrial environments require robust and efficient power systems. Laminated busbars offer the ideal synergy of performance and reliability. Manufactured with layers of conductive material surrounded by dielectrics, busbars offer the latest technological solution for modern industrial needs. Its optimized, customer-specific design without compromising performance enables easy integration into various industrial installations. **E-LAM** laminated busbars provide consistent performance by providing many advantages with their customer-specific designs.

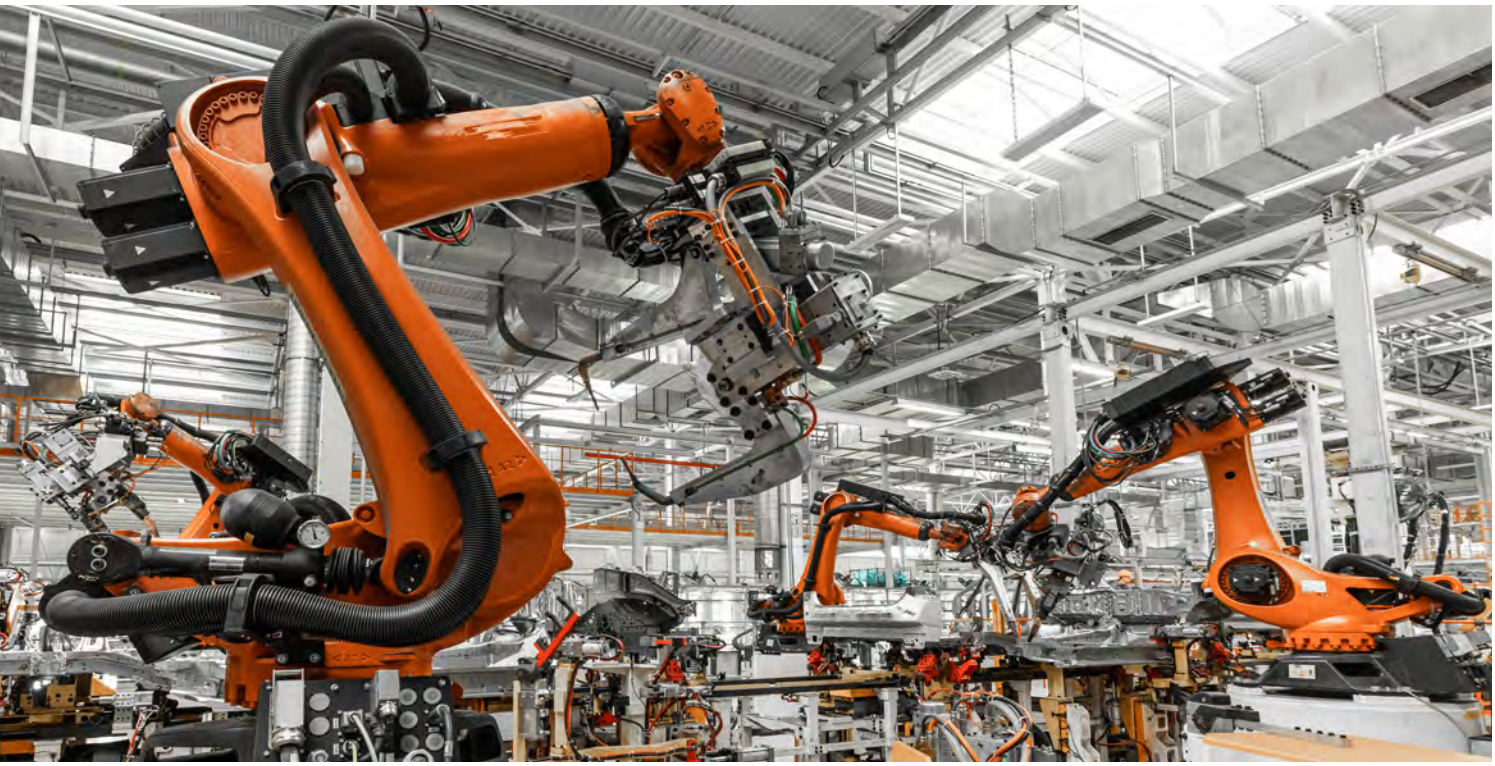
Silicon Carbide (SiC) semiconductor technology is today's industrial as it becomes increasingly accepted in applications, all EAE laminated busbar models are optimally designed, minimizing undesirable "voltage spikes" caused by the high switching nature of Silicon Carbide (SiC) applications.

Applications:

- LV / MV Converter Systems
- Power Regulating Systems
- Automation Systems
- Battery Module and Package Connections
- DC/DC, AC/DC Converters
- Powertrain







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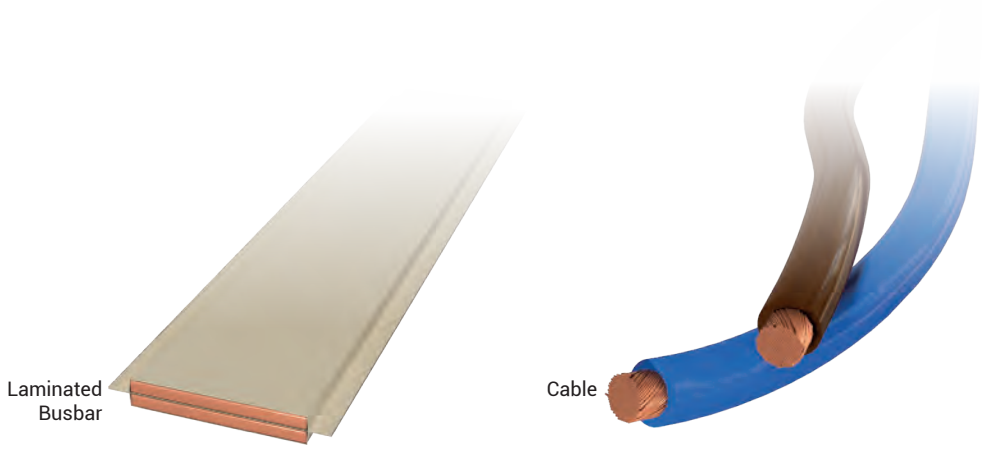
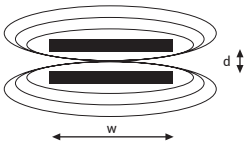
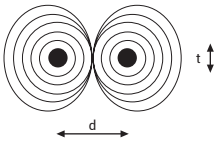
Laminated Busbar Electrical Design

The important properties of laminated busbars are resistance, inductance and capacitance. As the performance parameters of electronic equipment and components become more stringent, these characteristics become more important. These characteristics are important in solving the two most important problems for designers (resistance and noise) when determining the impedance of a power distribution organ. Therefore, it is important to understand the electrical properties of laminated busbar.

Below shows the laminated busbar, equivalent cable structure and mathematical models. Laminated Busbar consists of parallel conductor plates separated by insulating materials. Thanks to this configuration, it provides homogeneously distributed high thermal performance thanks to low voltage losses, minimized eddy currents and large surface area copper or aluminum plates. It eliminates partial discharge and dielectric problems that may occur with old cabling methods.



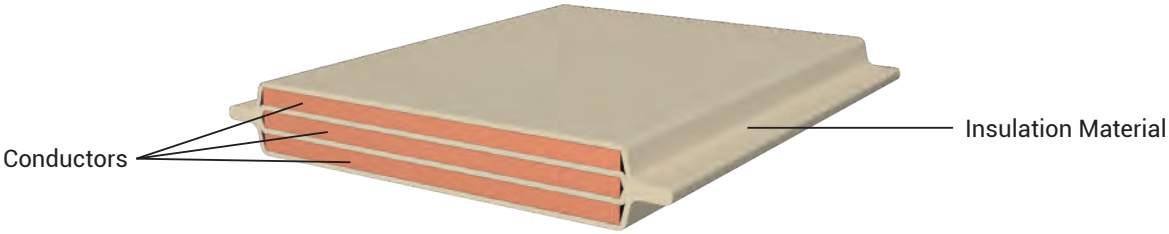
Inductance Length (l): 400mm Gap (d): 5mm Width (w): 100mm Thickness (t): 5mm	Busbar: 25nH $L=\frac{2\mu_0\mu_r l}{2\pi} In\left(1+\frac{t}{t+w}\right)$		Cable: 250nH $L=\mu ln(d/r)*l$	

Inductance is the ability to store energy in the form of a magnetic field.

E-LAM Laminated Busbars are designed for the lowest possible inductance. Low inductance means low characteristic impedance and more noise damping.

Insulation

Laminated busbars are covered with insulation layers of many different types and structures. Insulation capacity is increased with multi-layered and high temperature resistant glass fiber reinforced polyester materials, eliminating partial discharge and dielectric problems. Epoxy coated busbars provide maximum insulation in cross sections suitable for the required power and in a structure suitable for the design, allowing power transfer at constant values for many years.



Notes

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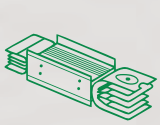
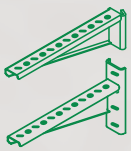
SUSTAINABLE FUTURE

Sustainability Management at EAE Elektrik

As part of our goal to support sustainable development and green transformation, measuring, evaluating, and managing all economic, environmental, and social impacts resulting from our sustainability practices is a key governance priority for EAE Elektrik. We act with great care in analyzing, monitoring, and managing the economic, environmental, and social impacts and risks that arise throughout our value chain in both our national and global operations.

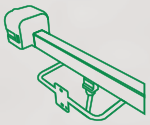


Busbar Systems



Support Systems

Cable Tray Systems



Trolley Busbar Systems

Fit-Out Solutions

"We are working together with all our stakeholders to develop the electrical technologies that will build the future."

You can visit our sustainability website at
surdurulebilirlik.eae.com.tr

#FutureTogether

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