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TECHNOLOGY

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Innovation finance technology

Category: **Elektronik und Optoelektronik**
Reference: **TD279**

Power Distribution System: Bus bars and bar batteries

Description:

As vital components for electrical power distribution in telecommunication satellites and land-based arms systems, the bus bars and bar batteries developed by the space technology provider ensure the distribution of reliable and constant energy.

Solutions are characterised by their flat shape and the use of aluminium which has the following advantages :

- mass reduction: Aluminium 1050A is ~3 time less heavy than Copper and the resistivity is only 2 times less)
- improved heat dissipation, (the shape and the coating type allows excellent heat transfer to cool it, even in radiative environment condition only)



Construction can be mono-layer or multi-layer (several potentials), flexible or rigid. The assembly of these links allows the connection of one or more electrical potentials while reducing the contact and line resistances at the maximum.

The high electrical conductivity of pure aluminium conductor integrated in the links gives on-board weight reduction and maximum electrical performance.

A double electrical insulation is made between each conductor with different types of insulating materials in order to guarantee an excellent insulation of potentials for all flight configurations. (typically more than 1000M Ohms). Ceramic coating is also available as bar insulation coating for hardened electrical insulation to increase mechanical feature.

Heat resistance of the system is optimised to evacuate heat at a maximum with a minimum of heat gradient between conductors, especially in a space environment where only conduction and radiation characteristics exist.

Interconnection of bars is made with dismountable flexible or rigid links (ESA wires, aluminium bars or multi braid links). Standard connectors like D-SUB are used as interface connector but the technology provider has developed and qualified power connector with low contact resistance.

Different links to the equipment require direct connection of the standard connectors to the conductors or soft wiring links soldered to traditional contacts. The fixing of the bars has been designed to allow for either heat dissipation from the bar to the support, or a flexible or rigid link from the bar to the support, or an electrical insulation from the bar to the support.

Innovative Aspects:

- Ceramic insulation: hardened electrical insulation
- Power Connector: low size high power connector
- Flexible links with bolted braid: for high current density

Application Areas:

The bars can distribute energy in different systems, e.g. in:

- different components of a battery (cells, bypass, shunt, connectors, ...)
- solar panels to the voltage regulation unit,
- batteries to the voltage regulation unit,
- voltage regulation unit to different equipment.
- land-based arms systems

Cooperation:

The product is already marketable. The technology provider is looking for customers for this product.