



GROUNDING SYSTEMS

SOLUTIONS FOR COMMERCIAL AIR

Space and Weight-Saving System-Level Solutions
for Aircraft Grounding and Bonding to Traditional and
Composite Airframes

iS Rayfast

GROUNDING SYSTEMS

Moving from Metals to Composite

Today's carbon-fiber-reinforced polymer (CFRP) aircraft bodies present new challenges in creating reliable, maintainable grounding networks. Traditional metal airframes are ideal for harmlessly dissipating lightning strikes and electrostatic discharges. Metal fuselages act as Faraday cages, channeling electricity through the fuselage to provide constant voltage on all sides of the enclosure. As a result, no current flows through the space.

Solving the Grounding Challenges of Composite Aircraft

CFRP composites have a lower level of conductivity compared with metals and therefore do not naturally create a Faraday cage.

New strategies for grounding and bonding are required to:

- Handle lightning, return, and fault currents
- Provide a bleed path for ESD
- Prevent damage to the composite
- Maintain a low-resistance pathway
- Minimize voltage differentials
- Provide electromagnetic shielding

Approaches like incorporating copper meshes into the composite's layers provide sufficient conductivity, which can create the required Faraday cage. This approach, however, presents challenges in connecting and bonding the meshes to the aircraft's metallic structures—with sufficient current-carrying capacity and distribution to handle currents.

Distributed Connectivity

As the use of composites grows for structural elements, highly distributed grounding systems, composed of both dedicated grounding paths and traditional metallic elements, are required. Typically, the ground paths run longitudinally along the length of the aircraft and laterally around the fuselage's circumference, and are bonded to provide redundant pathways. It is important to carefully analyze pathways to understand the flow of currents to ensure optimal performance and protection.





Connectivity Solutions for Today's Composites

As composites grow in use for aircraft bodies, there is less metal available for grounding and lightning protection. It is critical to know where the energy goes in the event of a lightning strike, short circuit, or other fault. Not only does the design need to be smarter, it needs to be complete. The system is the solution, and TE has the expertise to make it work.



TE provides system-level thinking and system-level solutions to grounding

Aircraft-Specific Custom Systems

We've worked with leading aerospace companies to create innovative solutions custom tailored for a specific aircraft. So you get a system that meets your design and not a generic approach you need to adapt to your needs.

Beyond Products to System Solutions

While we offer one of the widest ranges of products for grounding and bonding, our ability to integrate them into an elegant, hard-working solution is proof that the whole is greater than the sum of its parts.

Early Involvement Allows Optimized Solutions

Talk to us early to leverage the full power of our expertise. Early on, we can take your preliminary requirements and recommend the best way to satisfy them technically and economically.

What Do You Need in a Grounding System?

Protection

- Lightning protection
- Fault protection
- EMI protection

Modularity

- Quick installation
- Easy maintenance

Reliability

- Low resistance
- Energy absorption
- Fast fault finding

Peace of Mind

- Comprehensive design
- Cable management
- Time-tested components
- Long service life



Flexible, modular cable management enables easier routing and servicing of the system

TE Components . . . TE Technology . . . TE Know-how . . .

AMP | Agastat | CII | Hartman | Kilovac | Microdot | Nanonics | Raychem | Rochester | DEUTSCH

Get your product to market faster with a smarter, better solution.



The Complete System Solution Grounding and



Copper Ground Straps

High Performance

- Tinned copper for high conductivity
- Braided for flexibility
- High current-carrying capacity

Capable

- Traditional terminals or innovative quick-disconnect couplings



PIDG Pre-Insulated Terminals and Splices

Versatile

- Variety of tongue styles and platings
- 26 through 10 AWG
- MIL-T-2928 styles

Reliable

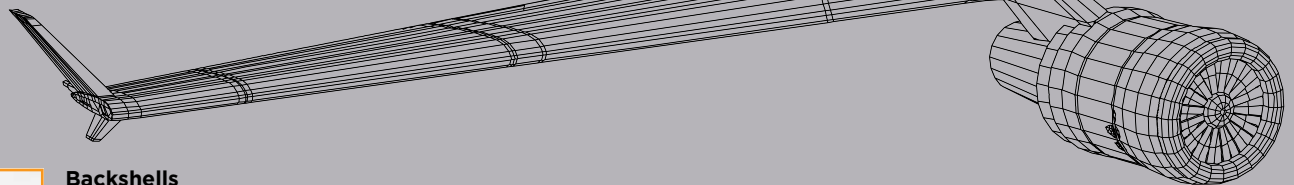
- Nylon insulation resists hydrocarbons



COPALUM Terminals and Splices

Versatile

- Terminates aluminum and copper conductors
- Dry crimp technology eliminates need for messy inhibitors
- 16 AWG to 500 MCM conductor range



Backshells

Wide Range

- Configurations for circular and rectangular connectors
- Raychem spin lock variable-angle backshells

High Performance

- Shield terminations for excellent EMC
- Strain relief and shielding



CTJ Series Terminal Junction Modules

Rugged and Compact

- Environmentally sealed
- Fluid resistant
- Vibration dampening

Capable

- Common bussing of 6 to 20 contacts
- AS81714 styles



Sensors, Monitors and Protective Relays

Over/Under Sensing and Monitoring

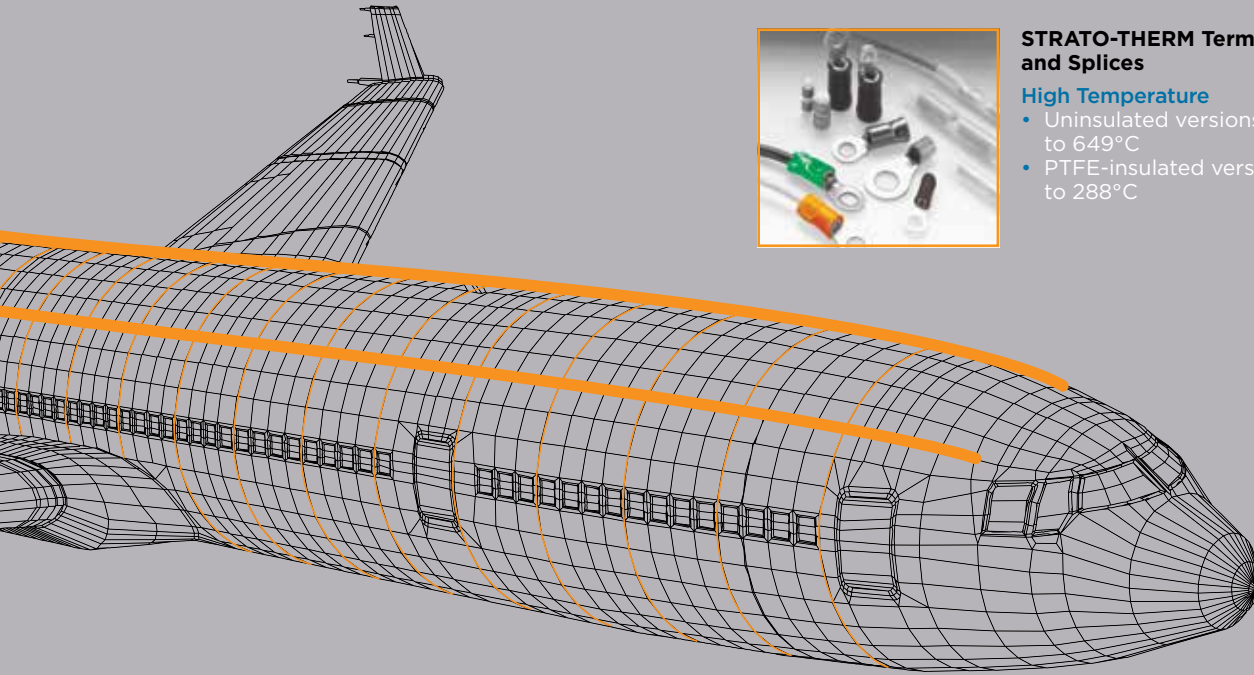
- Current
- Voltages
- Frequencies

Protection

- Ground power monitors
- Ground fault interrupters



on for Composite Aircraft d Bonding



RayBraid Copper Braid

Flexible

- Superflexible tinned copper braid with 90% coverage

Convenient

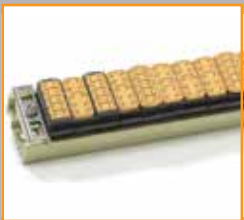
- Sizes from 3 to 38 mm diameter
- Easily removable inner former for easier use than flat-supplied braid



STRATO-THERM Terminals and Splices

High Temperature

- Uninsulated versions up to 649°C
- PTFE-insulated versions to 288°C



FMJ Junction Blocks

Modular

- Choice of 25 rail-mounted modules
- Light and compact
- Various bussing configurations

Flexible

- Sealed or unsealed
- Yellow and black anodized aluminum alloy



KILOVAC CAP30

Ground Fault Interrupter

Capable

- Electrically isolates load in event of ground fault
- 115/200 VAC
- 15 amps/pole

Convenient

- Built-in push-to-test function



SolderSleeve Grounding Terminations

Flexible

- Environmentally sealed, insulated, and encapsulated solder connection
- Wide range of temperature ratings, from -65°C up to 200°C
- Prefluxed solder preform provides a controlled soldering process



DBM Series Grounding Modules

Robust

- Fluid resistant, including aviation hydraulic fluid and JP5
- Lightweight nickel-plated aluminum shell
- 96-hour salt spray
- Accommodates twelve size 20 contacts for 80 A total current



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