

ECS Composites

4000 Series - FRP Composite Rackmount Cases

Product Specification-Authorized for Reprinting

Photo Highlights

- Riveted Aluminum CEA-310 Rack with Eight Multi-Axis Shock Mounts
- 10-32 Nut-Bar Fasteners for Equipment Panels
- Two Removable Covers
- Internally Engaging, Externally Operated Rotary Draw Pull Latches
- Water Tight Closures
- Case-to-Case Stacking Rails
- Recessed Hardware



Compact Shock Mounted Rackmount Cases

Case Description Summary – 4000 Series rackmount cases shall include –

- Shock mounted 19-inch aluminum racks in accordance with CEA Standard 310-E.
- One FRP thermoset composite center body.
- Two FRP thermoset composite removable covers.
- Extruded aluminum closures with gaskets.
- Stainless steel exterior hardware.
- External aluminum case-to-case stacking features.
- One automatic air pressure relief valve.

FRP Thermoset Composite Case Components – 4000 Series rackmount case center bodies and covers shall –

- Be compression molded on hydraulic presses using proprietary FRP elastomeric plug, compression molding technology to produce high impact, light weight, FRP composite components.
- Be reinforced with 60%-65% long chopped glass fibers and continuous glass fibers by weight in the composite material. Remaining material in FRP case components shall primarily consist of thermoset isophthalic polyester resin, with a small percentage of pigment for coloration of the composite parts.
- Be capable of being compression molded with a range of wall thicknesses and corner thicknesses to provide extraordinary transportation durability, impact resistance and stacking strength.
- Provide exceptional impact resistance and rugged durability at temperatures which exceed a range of -65° F to +185° F.
- Demonstrate high impact absorption characteristics to enhance shock and vibration protection for enclosed equipment.
- Be available with optional, premium priced, polyester/fiberglass composite materials to achieve super-light rackmount case weights.
- Be permanently pigmented and shall not be painted.

Water Tight Closures – Removable covers shall –

- Be water tight and shall provide protection from moisture, salt spray, sand and dust throughout the world's climate extremes.
- Have resealable closures comprised of a matching set of male and female 6063 alloy aluminum extrusions, in a wide range of extruded shapes, which are epoxy bonded to high impact, light weight, FRP composite components..
- Have closure gaskets which are mechanically retained in the female extruded aluminum profile such that adhesive is not required for gasket retention.

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CEA Standard 310-E Shock Mounted Rack – 4000 Series racks shall –

- Be manufactured from precision machined aluminum extrusions. Machined aluminum rack components shall be machine riveted with stainless steel semi-tubular rivets.
- Have aluminum vertical members which provide multiple equipment mounting capabilities. Racks shall have CEA compliant equipment mounting holes in front and rear vertical members and interior vertical rails for attachment of slides and brackets.
- Have diagonal aluminum braces riveted to the top and bottom rack surfaces to enhance rack rigidity.
- Have multi-axis elastomeric shock mounts installed between the rack and the center body of the case. Shock mount selection and mounting locations shall be determined based on the customer's representation of the center-of-gravity and the weight of customer specified equipment which will be installed in the rack.
- Be supplied with twenty (20) threaded self locking, 10-32 clip nuts which are capable of being installed in any of the equipment mounting holes in the rack.
- Have optional stainless steel nut bars with threaded 10-32 tapped holes for equipment mounting are available.

Exterior Hardware – 4000 Series rackmount case exterior hardware shall –

- Be available with recess mounted lever-action latches or internally engaging, externally operated rotary draw-pull latches.
- Employ latching solutions and extruded aluminum closure designs that permit rapid opening of sealed cases and rapid reinstallation and resealing of covers.
- Not employ latch or closure designs which require the use of tools for opening or closing rackmount cases.
- Be available with numerous handle styles.
- Unless specified otherwise, be 304 grade stainless steel with a clear passivated finish but shall also be available in stainless steel with black oxide finish or powder coated finishes.
- Be manufactured from cold rolled steel with appropriate plated finishes or powder coated finishes if suitable 304 grade stainless steel hardware is not available.
- Be recessed below the exterior perimeter surfaces of the rackmount case.

Stacking Features – 4000 Series rackmount cases shall –

- Include aluminum stacking features that allow rackmount cases to be stackable with covers installed or removed.
- Be available with exterior aluminum stacking features which include quick release hardware that allows one case to be secured on top of another.
- Allow electronic equipment to be accessible front and back for ease of cabling and operation when covers are removed.

Colors and Options – 4000 Series rackmount cases shall –

- Be available in most colors in accordance with FED-STD-595.
- Allow the installation and operation of numerous options and accessories, including casters, equipment slides, drawers, work surfaces, air conditioners and ventilation systems, exterior plug receptacles and other options which are required for effective utilization of rack mounted electronic equipment.
- Be available with shielded racks to provide EMI protection in accordance with MIL-STD-461 and/or conductive materials molded into the composite case shells to provide EMI shielding in accordance with MIL-STD-461.

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- MIL-STD-810F Performance Testing** –
- **High and Low Temperature** – 4000 Series rackmount cases and their components shall not exhibit any significant degradation in performance and/or strength when exposed to temperatures ranging from -65° F to +185° F in accordance with MIL-STD-810F, Methods 501 and 502 for storage and operational conditions.
 - **Drop** – 4000 Series rackmount cases with covers in place shall show no evidence of damage and/or degradation when drop tested in accordance with MIL-STD-810F, Method 516, Procedure IV from a height of 24 to 48 inches onto a 2-inch thick plywood surface backed by concrete. Impacts shall be conducted on all corners, flats and edges for a total of 26 drops.
 - **Basic Transportation Vibration** – 4000 Series rackmount cases with covers in place shall show no evidence of damage and/or degradation when exposed to vibration environments for a duration of 30 minutes per mutually perpendicular axis when tested in accordance with MIL-STD-810F, Method 514, Procedure I, Basic Transportation.
 - **Loose Cargo Bounce** – A 4000 Series rackmount case positioned in the upright position and with the covers in place shall show no evidence of damage and/or degradation when exposed to Loose Cargo Transportation environments for 30 minutes when tested in accordance with MIL-STD-810F, Method 514, Procedure II.
 - **Wind Blown Rain** – 4000 Series rackmount cases with the covers installed shall show no evidence of water intrusion and/or damage as a result of exposure to 40 mph wind blown rain conditions when tested in accordance with MIL-STD-810F, Method 506.4, Procedure I.
 - **Wind Blown Sand and Dust** – 4000 Series rackmount cases with covers installed shall show no evidence of damage and/or sand or dust intrusion when tested in accordance with MIL-STD-810F, Method 510, Procedures I & II – Blowing Sand and Dust.
 - **Fungus Growth** – 4000 Series rackmount cases and their components shall consist of materials that will not support fungus growth when tested in accordance with MIL-STD-810F, Method 508.
 - **Low Pressure** – 4000 Series rackmount cases shall not be damaged and/or degraded when exposed to low pressure environments when tested in accordance with MIL-STD-810F, Method 500, Procedures I and II.
- General** –
- 4000 Series rackmount cases shall comply with applicable performance requirements of the following commonly used standards and specifications.

• MIL-P-116	• MIL-C-4150J
• MIL-STD-130	• MIL-T-4734
• ATA-300	• MIL-T-21200
• MIL-STD-454	• MIL-T-28800F
• MIL-STD-648C	• MIL-STD-1472
• FED TEST METHOD STD 101	

Note: ECS hereby grants permission for this Product Specification to be reprinted in part, or in its entirety, in container specifications, engineering documents and drawings, Commercial Item Descriptions, procurement documents, and other documents which define the configuration, features, design and/or performance requirements for transit cases, rackmount cases, or other types of reusable containers for military and commercial applications.

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