

ECS Composites

FRP Composite Standard Transit Cases

Product Specification-Authorized for Reprinting

Photo Highlights

- **Conventional “Clam Shell” Transit Case Configurations**
- **FRP Composite Exteriors**
- **Optional Removable Cover or Hinged Cover**
- **External Draw Pull Latches and Cam Action Latches**
- **Water Tight Closures**
- **Surface Mounted Hardware**
- **Molded-in Case Stacking Features or Added Hardware**
- **Foam Cushions**
- **Optional Flanged Extrusions**



Standard FRP Transit Cases - Many Sizes, Limited Customization

Case Description Summary – FRP transit cases shall include –

- One FRP thermoset composite bottom shell.
- One FRP thermoset composite cover, either removable or hinged.
- Extruded aluminum closures with gaskets.
- Stainless steel exterior hardware.
- One automatic air pressure relief valve.

FRP Thermoset Composite Case Components –

FRP transit case bottom shells and cover shells 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 transit case weights.
- Be permanently pigmented and shall not be painted.

Standard FRP Transit Cases – FRP transit cases shall –

- Be available in many standard sizes for military and industrial applications. (For the complete range of ECS extreme FRP case sizes and configurations that are available, please review the ECS document titled: “FRP Composite Custom Cases - Product Features and Performance Highlights”).
- Be manufactured in uncomplicated designs – either as removable lid designs or as hinged clam-shell designs and with limited customization.
- Be available in a large number of case depths from standard compression molding tools.
- Be manufactured using proprietary FRP compression molding technology to produce high impact, light weight, FRP composite components.

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- Standard FRP Transit Cases – FRP transit cases shall –**
- Have FRP composite molded components epoxy bonded to heavy-duty aluminum extrusion closures, of a wide range of extruded shapes, which are able to satisfy the unique requirements of virtually any standard transit case application.
 - Allow the installation of a wide range of optional features and hardware to satisfy unique requirements such as hinged aluminum interior divider panels to provide stowage areas, flanged closure extrusions with floating fasteners to allow panel mounting of equipment, louvered ventilation panels, recessed electrical connector panels and an unlimited number of types of interior brackets.
 - Be impervious to fuels, oils and solvents, they shall be capable of being decontaminated if exposed to chemical warfare agents.
 - Protect enclosed equipment from the world's most challenging climatic and environmental conditions.
- Water Tight Closures – FRP transit case 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.
- Exterior Hardware – FRP transit case exterior hardware shall –**
- Be available with numerous latch styles, including externally mounted cam-action latches, recess mounted draw-pull latches and lever-action latches.
 - Employ latching solutions and extruded aluminum closure designs that permit rapid opening of sealed cases and rapid reinstallation and resealing of covers.
 - Employ latches and closure designs which do not require the use of tools for opening or closing of 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.

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- Stacking Features** – FRP transit cases shall –
- Include alternate types of stacking features that allow transit cases to be stackable with covers installed.
 - Include case designs manufactured without stacking features.

- Foam Cushions and Shock Mounts** – FRP transit cases shall –
- Be available with fabricated foam cushions to contain individual pieces of equipment and to provide shock and vibration protection.
 - Be available with fabricated foam cushion designs which are manufactured using CAD/CAM controlled foam cutting machinery and water-jet foam cutting equipment.
 - Have foam cushion designs which are able to incorporate a virtually unlimited range of foam cushioning materials to create required shapes and sizes of fabricated foam cushions required for the enclosed equipment.
 - Be available with shock mounts for shock and vibration control and/or shock mounted equipment platforms for the installation of equipment.
 - Be available with shock mount configurations and spring rates that are able to support a broad range of equipment weights and equipment centers-of-gravity.

- Colors and Options** – FRP transit 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, air conditioners and ventilation systems, exterior plug receptacles and other options which are required for effective utilization of enclosed electronic equipment.
 - Be available with 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** – FRP composite transit 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** – FRP composite transit 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** – FRP composite transit 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** – An FRP composite transit 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** – FRP composite transit 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** – FRP composite transit 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** – FRP composite transit 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** – FRP composite transit 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** –
- FRP composite transit 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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