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FRP Composite Custom Cases

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Custom FRP Cases - Unlimited Size and Customization

Case Description Summary – Custom FRP transit cases shall –

- Allow total design flexibility for military and industrial transit cases, resulting in endless design and performance alternatives.
- Allow the most complex case designs and the largest transit cases and enclosures imaginable to be manufactured from proprietary FRP compression molding technology.
- Protect enclosed equipment from the world's most challenging climatic and environmental conditions.
- Be impervious to fuels, oils and solvents, they shall be capable of being decontaminated if exposed to chemical warfare agents.

FRP Thermoset Composite Case Components – Custom FRP composite cases 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 for extremely large military and commercial equipment.
- Provide exceptional impact resistance and rugged durability at temperatures which exceed a range of -65º F to +185º 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.

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Unlimited Range of Fabricated Custom Cases – Custom FRP transit cases shall –

- Be manufacturable in an unlimited number of case sizes and shapes from standard FRP compression molding tools.
- Be capable of being assembled from numerous composite and metallic components to manufacture containers in virtually any combination of dimensions.
- Allow the utilization of a wide range of aluminum extrusion shapes, hardware items and custom fabricated parts to design and manufacture custom cases and enclosures which are able to satisfy the unique requirements of virtually any application.
- Utilize an unlimited range of hardware and options, including over 30,000 different items inventoried by ECS.
- Be capable of incorporating forklift handling features and specialized lifting hardware which may be required for exceptionally heavy containers and their enclosed equipment.

Water Tight Closures – Custom 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 an unlimited selection of hardware, 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.
- 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.

Stacking Features – Custom 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.

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Foam Cushions for Equipment Protection – Custom 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.

Shock Mounts for Equipment Protection – Custom FRP transit cases shall –

- Utilize shock and vibration attenuation systems which have been configured for the weight and center of gravity of the installed equipment, and which will provide shock and vibration protection in all three axes during shipment.
- Be available with an unlimited range of elastomeric shock mounts or helical isolator (cable) mounts to accommodate and protect unusually heavy equipment and a broad range of equipment centers-of-gravity.
- Be capable of utilizing fabricated aluminum, equipment mounting platforms with shock and vibration attenuation systems which allow platforms to “float” inside the container.

Colors and Options – Custom FRP transit cases shall –

- Be available in most colors in accordance with FED-STD-595.
- 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.
- 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 and flanged extrusions for panel mounted equipment.
- Be equipped, when necessary, with CAD/CAM custom machined special parts, hardware and brackets.
- Be supplied with custom molded recesses for tote handles, casters, lifting handles, latches and other exterior hardware.

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MIL-STD-810F Performance Testing –

- ***High and Low Temperature*** – Custom FRP transit cases and their components shall not exhibit any significant degradation in performance and/or strength when exposed to temperatures ranging from -65º F to +185º F in accordance with MIL-STD-810F, Methods 501 and 502 for storage and operational conditions.
- ***Drop –*** Custom FRP 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 –*** Custom FRP 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 –*** A Custom FRP 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 –*** Custom FRP 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 –*** Custom FRP 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 –*** Custom FRP 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 –*** Custom FRP 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 –

- Custom FRP 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 comercial applications.

ECS Composites January, 2007

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