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# ECS Composites

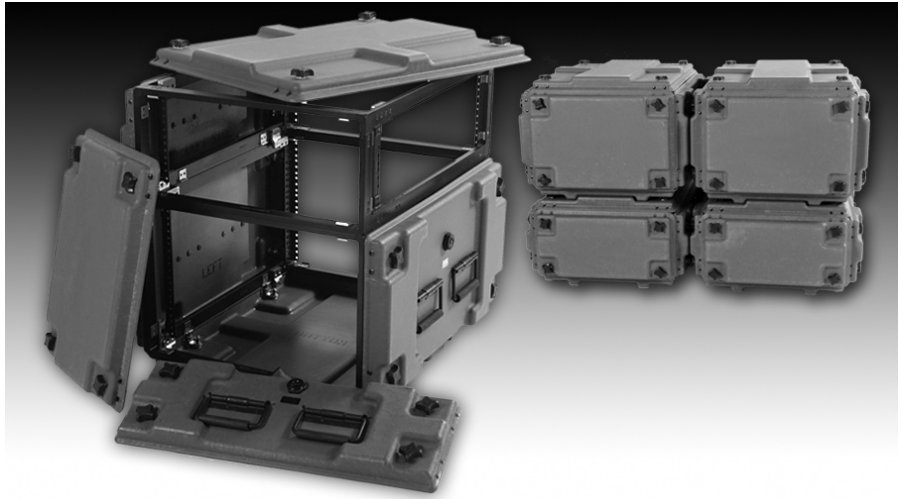
## TSC Stacking Rack Rackmount Cases

### *Product Specification-Authorized for Reprinting*

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#### **Photo Highlights**

- **Six Removable TSC Composite Covers**
- **Water Tight Gaskets**
- **Riveted Aluminum CEA-310 Rack**
- **10-32 Threaded Extrusions for Equipment Panels**
- **Recessed Hardware**
- **Internally Engaging, Externally Operated Rotary Draw Pull Latches**
- **Rack-to-Rack Stacking Hardware with Latches**



#### **Stackable Military Racks with Removable TSC Composite Covers**

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#### **Case Description Summary – Stacking rack cases shall –**

- Have 19-inch aluminum racks in accordance with CEA Standard 310-E with removable, sealed TSC composite covers on all six faces of each rackmount frame.
- Be designed and manufactured to be extremely compact rackmount frames which stack together and mechanically lock together with finger operated drop latches.
- Have TSC composite covers which are removable using fast-acting rotary latches and which allow the racks to be rain proof and transportable in military environments when reinstalled on the racks.
- Provide mobile protection and ultra-compact set-up of field portable military rackmounted electronic systems for use in small military shelters, shipboard compartments and military aircraft.
- Be impact resistance and ruggedly durable at temperatures which exceed a range of -65° F to +185° F.

#### **TSC Composite Case Covers – Stacking rack cases covers shall –**

- Have the ability to maintain a rain proof seal around the perimeter of each cover by compression of the gasket to the edges of the stacking rack frame and provide protection from moisture, salt spray, sand and dust throughout the world's climate extremes.
- Be capable of being installed on stacks of racks without dismounting the racks in order to fully or partially enclose an electronic system while maintaining an extremely compact footprint.
- Be impervious to fuels, oils and solvents and able to be decontaminated if exposed to chemical warfare agents.
- Be high pressure compression molded TSC composite manufactured on compression molding presses up to 1,200-tons in capacity.
- Be compression molded TSC components reinforced with 40% continuous glass fibers by weight in the composite material. Remaining material in TSC case components shall primarily consist of thermoplastic polypropylene resin, with a small percentage of pigment for coloration of the composite parts.
- Have compression molded TSC components with corners that are thicker than the flat wall sections to provide enhanced impact resistance.
- Have integrally molded resealable female closures with closure gaskets retained in the female profile of the cover using adhesive.

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## TSC Stacking Rack Rackmount Cases

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- TSC Composite Case Covers** – Stacking rack cases covers shall –
- Allow stacking rack composite enclosures to stack and nest together when covers are installed using integrally molded external case-to-case stacking features.
  - Utilize an automatic air pressure relief valve to protect the stacking rack enclosures from rapid internal pressure changes.

- Stacking Rack Cases** – Stacking rack cases shall –
- Protect enclosed equipment from the world's most challenging climatic and environmental conditions and fulfill a unique set of very challenging case performance requirements.
  - Provide the ultimate in rugged durability and the light-weight advantage of high-pressure compression molded TSC thermoplastic composite materials and machined aluminum components.
  - Have removable, sealed TSC composite panels on all six faces of each rackmount frame with stainless steel exterior hardware.
  - Be rain proof and provide protection from moisture, salt spray, sand and dust throughout the world's climate extremes when TSC composite covers are installed.
  - Be impervious to fuels, oils and solvents and capable of being decontaminated if exposed to chemical warfare agents.
  - Be available in a number of standard rack sizes for military and industrial applications.
  - Allow the installation of optional features and hardware to satisfy unique requirements of enclosed equipment.
  - Be designed for equipment weights up to 100 pounds.

- CEA Standard 310-E Stacking Racks** – Stacking racks shall –
- Be manufactured from precision machined aluminum extrusion components which mechanically interlock and are machine riveted with stainless steel semi-tubular rivets.
  - Have aluminum vertical members which provide multiple equipment mounting capabilities including CEA compliant 10-32 tapped equipment mounting holes in front and rear vertical members and interior vertical rails for attachment of slides and brackets.
  - Allow stacks of multiple racks to be rapidly mechanically fastened to each other using heavy-duty stainless steel sliding-hook fasteners and vertical drop-locks to create extremely compact rackmounted equipment workstations.
  - Allow racks to be secured onto the floor of shelters, vehicles or aircraft using heavy-duty stainless steel sliding-hook fasteners and vertical drop-locks.
  - Have covers that are removed using fast-acting rotary latches.
  - Allow rackmounted electronic equipment to be accessible from the sides, ends and top for ease of cabling and operation when covers are removed.

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- Exterior Hardware** – Stacking rack case exterior hardware shall –
- 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.
  - Be recessed below the exterior perimeter surfaces of the rackmount case.
  - Utilize ECS rotary latches, which are recessed into the covers and which employ the use of O-ring seals between the exterior knob and shaft of each latch to prevent moisture entry and which have cam-activated hooks that operate on the inside of the case in a rapid draw-down action to engage stainless steel strikes on the interior of the stacking rack frame.
  - Employ latching solutions that permit rapid opening of sealed cases and rapid reinstallation and resealing of covers as the knob continues to be turned and the latch pulls the cover tightly to the rackmount frame and compresses the cover gasket for a rain proof seal.
  - Not employ latch or closure designs which require the use of tools for opening or closing TSC containers or enclosures.
- Stacking Features** – Stacking rack cases shall –
- Include integrally molded stacking features on the TSC top and bottom surfaces of rackmount case center bodies which allow stackability of all stacking rack cases.
  - Allow stacking rack cases to be stackable with covers installed or removed, and allow covers to be removed and/or reinstalled while cases are stacked.
  - Allow electronic equipment to be accessible front and back for ease of cabling and operation when covers are removed.
- Colors and Options** – Stacking rack cases shall –
- Have TSC covers available in the most commonly specified military colors in accordance with FED-STD-595.
  - Have racks that are anodized in either clear or black finish.

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- MIL-STD-810F Performance Testing** –
- **High and Low Temperature** – Stacking rack 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** – Stacking rack 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** – Stacking rack 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 Stacking rack 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** – Stacking rack 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** – Stacking rack 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** – Stacking rack 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** – Stacking rack 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** –
- Stacking rack 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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