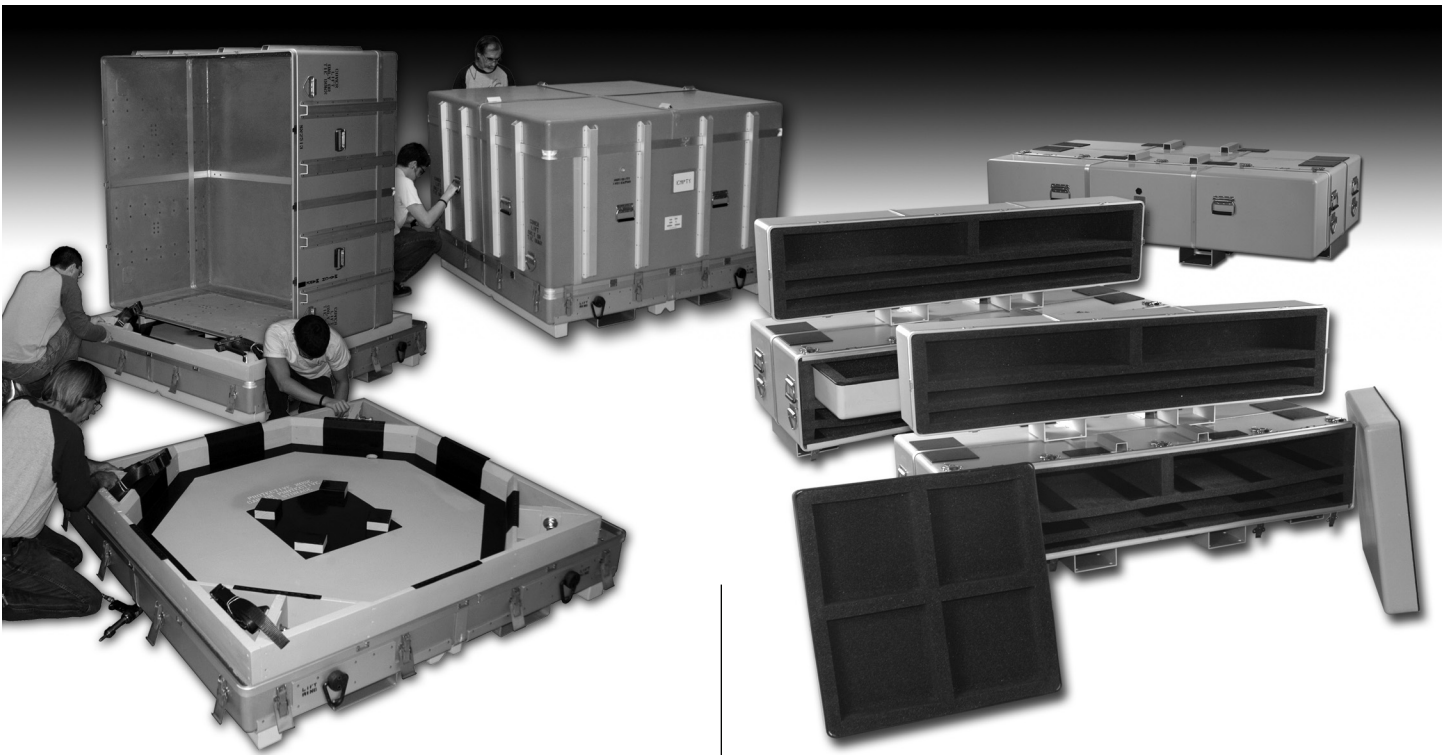


# ECS Composites

## FRP Composite Custom Transit Cases

### *Features and Performance Highlights*



**Custom FRP Transit Cases** – Unlimited Size and Customization – FRP – Fiberglass Reinforced Thermoset Composites allow total design flexibility for military and industrial transit cases and reusable containers. FRP composite cases are the most durable custom military transit cases and enclosures anywhere. Since 1960, FRP composite cases have repeatedly proven their superiority... from cases for toteable test sets... to EMI shielded workstations... to one-of-a-kind containers for \$100-million satellites. FRP custom cases allow endless design and performance possibilities.

**Extreme Cases and Complex Designs** – FRP custom cases include the most complex designs and the largest transit cases and enclosures ever manufactured by ECS. Extreme cases and containers are manufactured using proprietary FRP compression molding technology. High impact, light weight, FRP composite components are epoxy bonded to heavy-duty aluminum extrusions. This fabrication method allows ECS to create extremely large transportable enclosures for oversized equipment.

**Total Protection From The World's Environments** – Water tight FRP composite cases provide protection from moisture, salt spray, sand and dust throughout the world's climate extremes. Impervious to fuels, oils and solvents, they can also be decontaminated if exposed to chemical warfare agents. ECS FRP containers have protected

extremely expensive military equipment, including \$100-million satellites, from the world's most challenging climatic and environmental conditions.

**Strength to Match the Application** – Light in Weight – The unique FRP molding process at ECS provides the lightest and most impact resistant, custom designed, hermetically sealed containers known to man. Optional, premium priced, polyester/fiberglass composites can be compression molded by ECS to achieve super-light transit case weights. FRP composite exteriors can be compression molded with a range of wall thicknesses and corner thicknesses capable of providing extraordinary transportation durability, impact resistance and stacking strength for large military and commercial equipment.

**Extremely Durable FRP Thermoset Composite Parts** – Compression molded FRP parts have 60%-65% glass fiber reinforcement in a thermoset polyester resin base. Composite parts are compression molded on hydraulic presses with capacity up to 150-tons. High glass fiber content in the FRP case shells provides exceptional impact resistance and rugged durability at temperatures which exceed a range of -65° F to +185° F.

# ECS Composites

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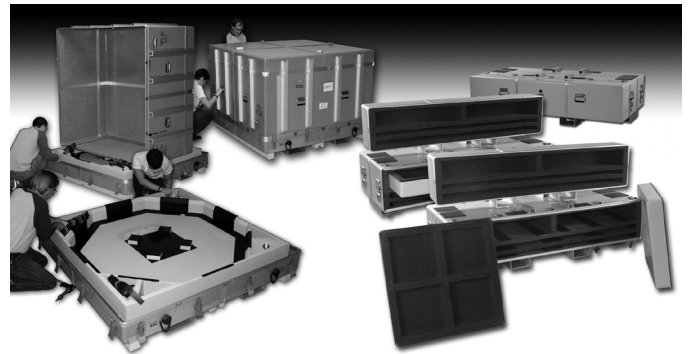
### *Features and Performance Highlights*

**Unlimited Range of Fabricated Case Sizes** – FRP materials allow total design flexibility for military and industrial transit cases and reusable containers. FRP molded shapes and FRP flat panels are routinely epoxy bonded together with heavy-duty aluminum extrusions shapes to manufacture much larger containers than the FRP case shells that can be molded in any of ECS' hundreds of FRP compression molding tools. With clever application of a wide range of aluminum extrusion shapes, hardware and custom fabricated parts, ECS is able to design and manufacture an FRP custom case or enclosure to satisfy the unique requirements of virtually any application.

**Unlimited Range of Hardware and Options** – ECS maintains over 30,000 different items in inventory and has an impressive CAD/CAM machining capability for special parts. FRP cases can be molded with recesses for tote handles, casters, lifting handles, latches and other exterior hardware. Toteable FRP cases for electronic test sets can include molded-in EMI shielding and flanged extrusions for panel mounting equipment. FRP cases can be manufactured in virtually any color under the sun.

**Extreme Equipment Weight Range** – FRP custom palletized designs can incorporate the features common to a hermetically sealed composite enclosure with the forklift handling features of a sea-going freight container. FRP custom cases and enclosures can be supplied with an unlimited number of shock mounts to accommodate and protect unusually heavy equipment.

**Unlimited Range of Interior Structures** – Fabricated aluminum platforms are frequently installed inside large FRP containers. Shock mounts, engineered by ECS to match the weight and fragility of the equipment, allow each platform to "float" inside its container. Shock mounted platforms assure that large electronic systems, antennas, satellites and other large military equipment will be protected from shock and vibration during shipment.



**Shock Mounts and Cushions for Equipment Protection** – Shock and vibration attenuation can be provided by elastomeric shock mounts, helical isolator (cable) mounts and custom fabricated foam cushions. The high impact absorption characteristics of FRP composite materials enhance shock and vibration protection for enclosed equipment. Custom designed foam cushions are manufactured by ECS using computer controlled equipment. Shock mounts are configured for the weight and center of gravity of the installed equipment, and they provide uniform performance in all three axes. Optional shock mount configurations and spring rates can be provided to support a broad range of equipment weights and equipment centers-of-gravity.

**Fast Container Opening and Resealing** – FRP custom cases and enclosures are available with numerous latch styles, including externally mounted cam-action latches, recess mounted draw-pull latches and lever-action latches. All FRP latching solutions and extruded aluminum closure designs permit rapid opening of sealed cases and rapid reinstallation and resealing of covers. None of the ECS latch or closure designs require the use of tools for opening or closing FRP containers or enclosures.

**Hardware, Colors and Options** – An unlimited selection of hardware is available. Numerous options and accessories are available. FRP custom cases can be manufactured in most colors, including MIL-STD-595 colors.

**Military Grade** – FRP custom composite cases exceed the requirements of military specifications for transportable cases. Performance verification testing to MIL-STD 810 is routinely performed at ECS Composites. Originally qualified by ECS in 1962 under the severe performance requirements of MIL-C-4150, FRP cases continue to evolve with enhanced materials and compression molding techniques to provide sophisticated container solutions for 21st Century applications.

# ECS Composites

## FRP Composite Custom Transit Cases

### *Features and Performance Highlights*

**FRP Tooling List with Dimensional Possibilities for FRP Custom Cases  
(These Molds Don't Have Stacking Ribs – Best For FRP Custom Cases)**

FRP Mold P/N	Outside Case Length Without Hardware (Inch)	Maximum Doubled Case Length Outside (Inch)	Maximum Tripled Case Length Outside (Inch)	Outside Case Width Without Hardware (Inch)	Maximum Doubled Case Width Outside (Inch)	Maximum Case Depth Outside (Inch)	Maximum Doubled Case Depth Outside (Inch)	Minimum Case Depth Outside (Inch)	Vertical Radius O.D. (Inch)	Horizontal Radius O.D. (Inch)
387	10.01	17.53	25.04	5.77	9.04	12.50	22.50	4.50	1.00	1.00
432	11.39	20.28	29.17	11.38	20.27	31.50	60.50	4.50	1.00	1.00
403	12.75	22.63	32.51	9.76	16.65	17.50	32.19	4.81	1.19	1.16
322	12.79	23.09	33.38	9.44	16.39	14.50	26.50	4.50	1.00	1.00
353	12.80	23.11	33.41	9.37	16.25	8.75	15.00	4.50	1.00	1.00
361	13.14	23.52	33.91	13.15	23.56	14.50	26.25	4.75	1.13	1.13
449	14.17	25.83	37.50	10.18	17.85	19.75	37.00	4.50	1.00	1.00
356	14.37	26.24	38.12	8.37	14.25	11.75	21.00	4.50	1.00	1.00
433	15.13	27.76	40.39	14.01	25.53	20.63	38.75	4.50	1.00	1.00
425	15.39	28.28	41.16	14.87	27.24	13.75	25.00	4.50	1.00	1.00
424	16.07	29.64	43.21	9.33	16.15	25.76	49.02	4.50	1.00	1.00
327	16.72	30.68	44.65	14.72	26.69	10.00	17.25	4.75	1.13	1.13
481	17.07	31.63	46.20	10.20	17.91	12.50	22.50	4.50	1.00	1.00
390	17.08	31.66	46.24	5.31	8.11	9.00	15.50	4.50	1.00	1.00
352	17.11	31.47	45.84	10.63	18.51	20.74	38.61	4.88	1.13	1.19
459	17.12	31.74	46.35	11.12	19.74	7.50	12.50	4.50	1.00	1.00
420	17.25	32.01	46.76	10.99	19.48	35.50	68.50	4.50	1.00	1.00
357	17.78	32.94	48.09	6.13	9.64	11.50	20.38	4.63	1.06	1.06
391	19.26	36.01	52.77	9.27	16.03	35.75	69.00	4.50	1.00	1.00
464	19.38	36.26	53.14	16.50	30.50	7.00	11.50	4.50	1.00	1.00
359	19.59	36.57	53.54	19.59	36.57	7.62	12.62	4.62	1.06	1.06
394	19.75	37.01	54.26	8.01	13.53	7.50	12.50	4.50	1.00	1.00
456	19.86	37.22	54.58	16.61	30.71	30.25	58.00	4.50	1.00	1.00
457	19.87	37.23	54.60	11.37	20.25	36.13	69.75	4.50	1.00	1.00
438	20.23	37.97	55.70	13.25	24.01	44.50	86.50	4.50	1.00	1.00
335	21.01	39.27	57.53	20.12	37.49	33.50	64.25	4.75	1.13	1.13
582	21.75	41.00	60.25	16.70	30.90	8.50	14.50	4.50	1.00	1.00
551	22.33	41.90	61.47	18.68	34.60	23.24	43.72	4.76	1.13	1.13
412	23.12	43.75	64.37	17.71	32.92	21.00	39.50	4.50	1.00	1.00
542	24.02	45.54	67.06	11.00	19.50	15.50	28.50	4.50	1.00	1.00
543	24.02	45.54	67.06	15.24	27.98	15.50	28.50	4.50	1.00	1.00
351	24.26	45.65	67.04	11.01	19.14	49.50	96.13	4.88	1.19	1.19
404	24.50	46.38	68.25	13.13	23.64	25.50	48.38	4.63	1.06	1.06
339	24.65	46.55	68.45	15.48	28.21	50.50	98.00	5.00	1.13	1.25
488	25.25	47.99	70.74	19.24	35.97	29.50	56.50	4.50	1.00	1.00
487	25.25	48.00	70.75	15.24	27.98	26.00	49.50	4.50	1.00	1.00
604	25.25	48.00	70.75	19.25	36.00	16.50	30.50	4.50	1.00	1.00
624	27.60	52.44	77.28	21.60	40.44	47.50	92.24	4.76	1.13	1.13
556	27.75	53.00	78.25	19.75	37.00	33.25	64.00	4.50	1.00	1.00
502	28.26	54.02	79.78	17.25	32.00	32.25	62.00	4.50	1.00	1.00

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398	28.32	54.13	79.95	12.81	23.13	17.50	32.06	4.88	1.00	1.22
605	29.25	56.00	82.75	10.25	18.00	8.76	15.02	4.50	1.00	1.00
536	34.55	66.60	98.66	29.59	56.67	49.76	97.02	4.50	1.00	1.00
486	36.24	69.74	103.23	36.26	69.77	15.50	28.26	4.74	1.12	1.12
422	36.26	70.01	103.77	13.25	23.99	16.88	31.25	4.50	1.00	1.00
460	40.55	78.10	115.65	20.66	38.31	23.50	44.00	5.00	1.25	1.25
445	41.24	79.98	118.72	12.25	21.99	20.50	38.50	4.62	1.00	1.00
399	44.12	85.55	126.97	34.23	65.76	25.38	48.25	4.50	1.09	1.00
400	48.12	93.19	138.25	43.27	83.47	25.28	47.50	5.06	1.28	1.28
405	48.20	93.90	139.60	9.79	17.08	12.75	23.00	4.50	1.00	1.00
549	60.85	119.20	177.55	26.65	50.80	8.30	14.60	4.00	1.00	0.75