

The DoorwayTM

M.C. Gill Corporation Group of Companies

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CASTLE INDUSTRIES

Whatever You Want to Do With Metal

Whatever You Want

Castle Industries, Inc. of California

Companies making simple metal parts were traditionally referred to as *metal benders* or *sheet metal shops*. Those were the days when it took far less expertise than it does now to address the complex requirements of the contemporary aerospace market. These terms may still apply to some companies who handle simple metal parts; however, the ability of Castle to handle far more sophisticated metal components and assemblies clearly sets it apart.

Castle specializes in machined and formed metal parts, and aircraft assemblies for commercial and military programs. If a piece of metal can be formed, machined, cut, pressed, punched, joggled, shaped, welded, profiled or fabricated into a high-performance part or assembly, Castle has the equipment and experience to do it.



to Do with Metal

Castle uses steel and aluminum welders certified to AMS STD 1595 to produce aircraft assemblies such as seats, consoles and electronic equipment racks. Castle employees are specialists in a wide range of complex metal component manufacturing. These highly trained technicians have a depth of practical experience that is demonstrated in the quality of their work. Additionally, when outside experts are needed in fields such as stress analysis, testing and design evaluation, Castle has a considerable group of professionals to call upon. Castle offers complete project support from samples to final production.

Airborne Electronics Racks and Consoles

Castle has the engineering expertise and manufacturing experience needed to design and build light-weight aluminum electronics racks and consoles for military airborne programs. These custom-made racks and consoles are specifically designed to carry heavy equipment loads while meeting well-defined crash-load and ultimate flight loading conditions. The individual designs consider where the enclosure is located in the aircraft, orientation of the enclosure and varying g-force loading. A stress analysis is performed to determine the lowest possible weight for each enclosure.

A group of racks and consoles are made for the Compass Call C130 Program. Each rack and console uses a Gillfab™ 5120 panel – which is a very thin sandwich panel made with aluminum skins and aluminum honeycomb – manufactured by M. C. Gill Corporation in El Monte, California. The aluminum honeycomb in the panel is produced by Alcore, one of the M.C. Gill Corporation Group of Companies. Additional light-weight equipment racks were designed, tested and produced for the U.S. Air Force Airborne Laser Program. The Airborne Laser is a multi-

megawatt chemical laser, mounted in a Boeing 747-400, designed to destroy enemy missiles seconds after they are launched.

Some designs require electromagnetic interference (EMI) shielding. For these applications, custom-designed filters are used to shield the equipment cooling vents with conductive gasket seals for doors and side panels. Castle has supplied equipment racks and consoles to several major electronics manufacturers, system integrators, major sub-contractors and prime contractors.

Mechanical Assemblies

Castle produces a variety of aircraft assemblies used in attendant and observer seats, electronic consoles, fuselage sections and decompression systems. These include DADO panels for 747 passenger aircraft that respond to rapid decompression emergencies. Other types are assemblies and sub-assemblies produced from machined and formed aluminum, with various types of fasteners for a range of applications. These assemblies use the combined skills of welding, sheet-metal working, metal machining, sewing and precision assembly.

Aircraft Components

Aircraft parts come in all shapes and sizes. For example, in 747-400 passenger-to-freighter conversions, Castle supplies over 130 different components and assemblies. Castle will fabricate to customer-supplied drawings or can assist in designing components.

Most applications use aluminum, but Castle also works with titanium, stainless steel, composites and steel. Each month large and small quantities of tear straps, doublers, angles, stiffeners, brackets, channels, tees, intercostals, webs and seat clips are produced. These components are used to produce floor beams, door assemblies and fuselage sections.





C-17 in flight



C-17 crew rest seats with folding back

C-17 Program Crew Rest Seats, a Castle Industries Showpiece

Crew Rest Seats made by Castle for the C-17 Program involve fabrication of numerous custom-made components that must be strong and light. Seat comfort is also very important during the long flights of this transport aircraft. The dual seat design includes two communications harnesses, two oxygen lines and separate recline systems.

Production of C-17 Crew Rest Seats requires all of the capabilities of the Castle team. Each seat requires certified aircraft welding, aluminum and steel machining, sheet metal forming and precise assembly. All the assembly fixtures and tools required to build the seat are produced in-house. In addition, the upholstery, painting and final assembly are performed in-house.

Airborne Technician Seats

Castle also makes ergonomically designed Airborne Technician Seats for operators who are required to sit at their stations for extended periods of time. These are constructed to be compact, lightweight and comfortable. They swivel 360 degrees, with eight locking index positions, and are designed for adjustable track



Airborne technician seat

mounting. The seat withstands 16g loads and has been tested for takeoff, flight and landing conditions. The complete seat weighs less than 40 pounds.

Observer Seats

Aircraft observer seats are one of the product lines Castle is known for throughout the industry. One or two observer seats are wall mounted behind the pilots in commercial airplanes, for use by FAA observers and other airline personnel. For comfort, the seats are padded with sheepskin and have fold-down armrests.

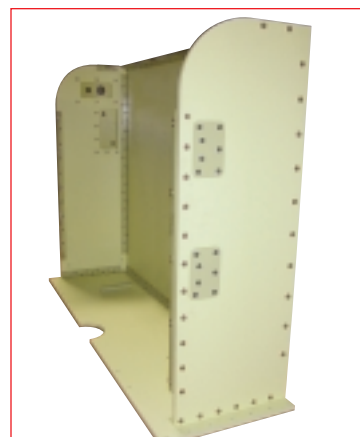


Boeing Part Number	Castle Part Number	Airplane Model	Location
S232N301-9	0801801-10	757 and 767	2nd Observer
S232N301-10	0801801-11	757 and 767	1st Observer
S232N301-11	0801801-12	757 and 767	2nd Observer
S232T305-1	17-001-1	767	2nd Observer
Armrests: Castle part numbers 0801801-10 and 0801801-11 have folding armrests and part numbers 0801801-12, 0801801-12 and 17-001-1 do not have armrests.			
Upholstery: Castle part number 0801801-11 has all-wool seat and backrest covers. Part number 0801801-10, 0801801-12 and 17-001-1 have sheepskin seat and backrest covers. Replacement covers and cushions can be ordered directly from Castle Industries.			

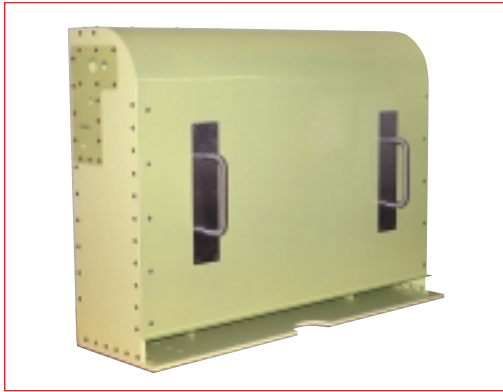
Observer seats come in four models for use on 757 and 767 models. The seats are also used in the crew rest area of some 747s. They all have either four or five point harnesses.

Hydraulic Enclosures Use Range of Company Products

Castle Industries is often called upon to fabricate components, assemblies, enclosures and other products for aircraft conversions. A recent example of a custom-made product is a specialized box assembly for use as a hydraulic enclosure. This assembly is used in a 757-200 freighter conversion program.

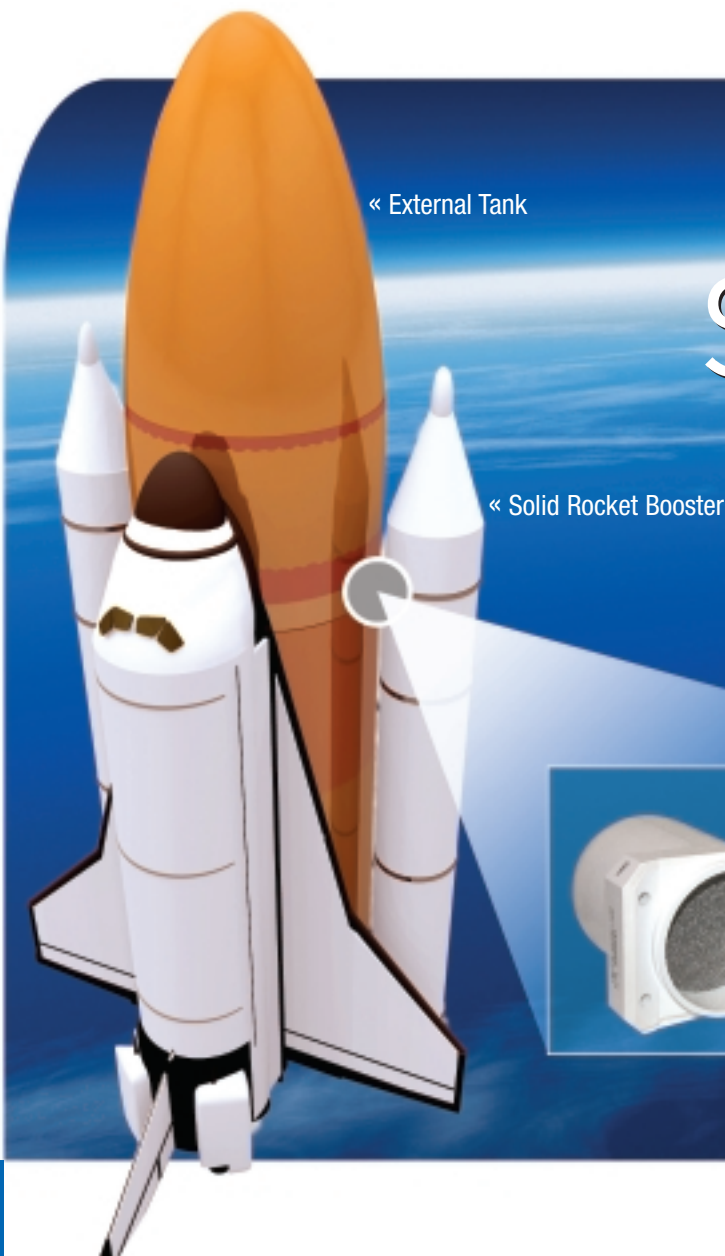


This 757-200 conversion program hydraulic enclosure was fabricated from M.C. Gill Corporation panels. These are made of Alcore's Duracore™ aluminum honeycomb and aluminum skins. This product is a good example of how the capabilities of the M.C. Gill Corporation Group of Companies can be combined.



Toolmaking Capabilities Assure Quality Complex Part Fabrication

Castle Industries builds its own tools for forming metal and plastic. Having in-house toolmaking capability assures that a precisely made tool is available to the machinist when needed and reduces the amount of time required to start production. The result is a consistently better product with the added ability to modify a tool if required.



Alcore Space Shuttle Participation Honored



About two minutes after launch, explosive bolts fire to separate the Solid Rocket Boosters from the External Tank. The Columbia Accident Investigation Board found the system designed to catch the bolts could pose a debris hazard to the orbiter. The bolt catcher has been redesigned and is now a single piece rather than a two-piece welded design.

Clearly, the best way to offer quality metal products to customers is to start the process by making the best tools needed for forming, production, assembly and inspection of the finished product.

Castle Industries – Your Project Partner

Castle is always adding new design and fabrication techniques to assure a consistent, reliable product. Few suppliers that fabricate aerospace metal parts and assemblies have such a wide range of capabilities.



For Additional Information:

You will find more information about
Castle on-line: www.mcgillcorp.com

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Alcore received a Certificate of Appreciation in recognition of their dedicated service to United Space Alliance (USA).

USA is the prime NASA contractor in charge of the Space Shuttle Flight Operations. Alcore supplies the honeycomb for the Space Shuttle's Solid Rocket Booster Forward Bolt Catcher. This award recognizes the quality product Alcore provides the program.

What is a *bolt catcher*? When the Solid Rocket Booster separates from the large external Tank and Orbiter, a special bolt is fractured. During this maneuver the Forward Bolt Catcher stops and captures the 35-pound bolt which is traveling approximately 50 miles per hour. The function of the honeycomb within this device is to absorb the impact, which is critical to assure that no debris is released during the Solid Rocket Booster separation. Alcore's part is critical, as a failure could lead to loss of the mission.

Alcore is proud to be a recognized supplier to the Space Program, and honored to participate in Space Shuttle Operations.

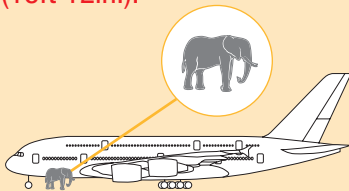


Up, Up and

M.C. Gill Group

A380 Gee-Whiz Facts

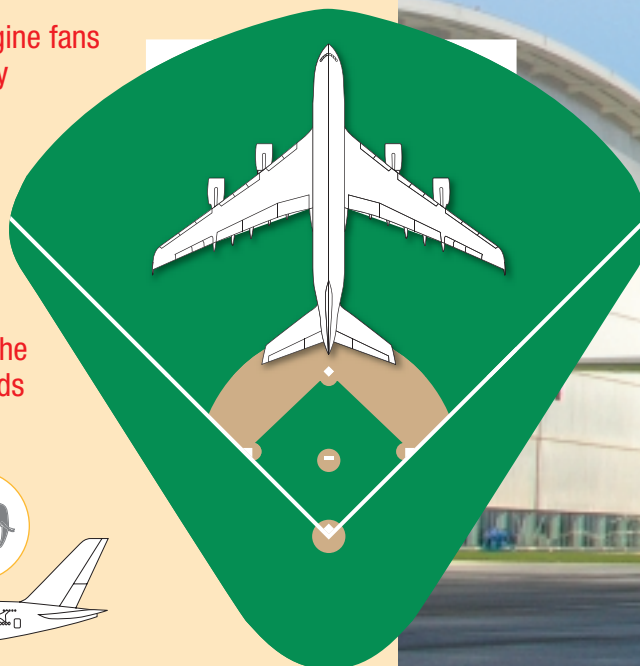
- 1.** Lengthwise, the A380 stretches from goal line to goal line of an American football field, while its wing tips would hang well beyond the sidelines.
- 2.** The A380 offers 30%-50% more seating than the largest current commercial aircraft.
- 3.** The A380 is expected to use 20% less fuel, will fly more quietly and be more environmentally friendly than other jumbo aircraft.
- 4.** The volume of the three decks (the two decks of cabins and the deck of cargo) is 1570 cubic meters (55,446 cubic feet), large enough to hold 35-million ping-pong balls.
- 5.** With all seats removed, the A380 provides enough space to accommodate 10 squash courts.
- 6.** The A380 is expected to burn less than three liters of fuel per passenger over 100km, a rate comparable to that of an economical family car.
- 7.** The titanium engine fans will operate at nearly 3,000 rotations per minute with fan tip speeds reaching one-and-a-half-times the speed of sound.
- 8.** During takeoff, the wing will flex upwards by over four meters. (13ft 12in.).



A380 size compared to an American baseball diamond and an elephant

As the world watched, the A380 completed its first test flight from Toulouse, France, on 27 April 2005, making aviation history. It is hard to comprehend the scale of an aircraft capable of carrying upwards of 800 people. The A380 is the largest commercial passenger plane to date and has earned the name *Super Jumbo*.

The A380 carries several parts and materials manufactured by the M.C. Gill Corporation Group of Companies. At the headquarters facility in El Monte, California, state-of-the-art A380 floor panels are manufactured, using carbon fiber skins with Kevlar® honeycomb core. Detailing of the cockpit and electronics bay floor panels is completed at M.C. Gill Corporation Europe Ltd., in Northern Ireland. This includes cutting the complex panel shapes on a CNC machine and finishing them with metal fittings, insulation and structural elements. These are then incorporated into the A380 nose section at Airbus in St. Nazaire.



Awaaaay

Products Aboard Airbus A380 First Flight

El Monte also supplies a range of Kevlar® honeycomb types for the production of composite trailing edge wing panels, both in the USA and the United Kingdom.

Alcore Inc. manufactures several aluminum honeycomb types used in wing and engines nacelle assemblies. Machined and formed honeycomb parts are manufactured from these materials by Alcore Brigantine in France, another of the Group of Companies. These include inner fixed structure, acoustic panel and thrust reverser blocker door details for engine nacelles. Alcore Brigantine also manufactures 5-axis machined leading edge slat details from aluminum honeycomb, as well as providing tooling for the belly fairing assemblies on the A380.

Additional applications of M.C. Gill products are still in development for both the passenger and the freighter versions of the A380.



“The most important achievement through this partnership has been the opportunity to help make a mark on the future of aviation,” Irv Freund, VP Sales and Marketing said after the first flight. “We are thrilled to be working with Airbus and to be a member of the A380 team.”

“Airbus is proud to work with the M.C. Gill Corporation Group of Companies, who believed in the success of the A380 and worked hard to help us realize Airbus’ vision,” responded Airbus North America Chairman Allan McArtor. “This first flight is the culmination of a pioneering effort by all those involved on the A380 project. The maiden flight pays tribute to all the cooperation and hard work that has been contributed for the past 101 years of flight.”

The A380 is expected to enter service in 2006 after rigorous flight tests and certification. As we go to press, Airbus has 154 orders for the A380 aircraft with commitments from 15 customers worldwide.



Cockpit Floor Panels

GillShots

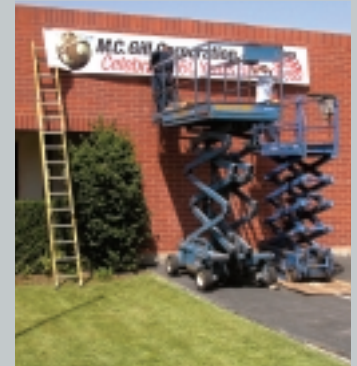
Employees of Alcore Inc. in Edgewood, Maryland, receive a certificate of appreciation from Lililee Johnson – USA Deputy Chief Engineer, Gary Henderson – USA Supplier Relations, Carol Farran – USA Subcontract Management Director, Doug Whalin – USA SRB SQ&MA Director, in recognition of the company's dedicated service to United Space Alliance, the prime NASA contractor in charge of Space Shuttle Flight Operations.



Ken Boudreau, CEO of M.C. Gill Corporation, and Ray Vaughan, Production Manager of Alcore, accept the United Space Alliance certificate of appreciation.



To celebrate the M.C. Gill Corporation 60th anniversary, banners are displayed on several buildings.



M.C. Gill Corporation 1945 TO 2005
Celebrates 60 Years of Success



Future Merit Badge

Composites Merit Badge



Catch the Wave

Surfboard Lamination Demonstration



Visit and Support Composites Merit Badge Future Badge Demonstration – in Virginia

Boy Scout National Jamboree

July 25 – August 3, 2005

Development of a new merit badge for the Boy Scouts of America is nearing completion, with a demonstration booth at the National Jamboree. With major funding support from M.C. Gill Corporation, a Composites Merit Badge concept will be demonstrated. Scout Leaders and visitors who will number more than 40,000 at this event.

Anyone can visit the Jamboree and see the booth first hand. It takes place at Fort A.P. Hill, about 40 miles south of Washington, D.C. Surfboards will be laminated, and explanations given about composites and how youth can benefit from learning about these materials. Groups of Scouts will get hands-on experience by helping with laminating the surfboard blanks.

The booth will be located adjacent to the *Boy's Life Magazine* display.

More information about visiting the Jamboree including directions:
<http://www.scouting.org>

To learn how you can help support in development of the Composites Merit Badge:

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Alcore does not sell sandwich panels. Contact M.C. Gill for these products.



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Trivia

Cornell College in Iowa is the only school in the USA to have its entire campus listed on the National Register of Historic Places.



Iowa is the only state name that starts with two vowels.



Campers and motor homes are manufactured in Winnebago County, Iowa. They're called Winnebagos. Conestoga wagons, used during the early days of wagon trains, are named for the Conestoga River in Pennsylvania.



Cigars got their nickname of "stogies" from the Conestoga wagon drivers who smoked cigars or "stogies" as they drove the trail.



Most wagons on the Oregon Trail were not Conestoga wagons. These were slow, heavy freight wagons. Most Oregon Trail pioneers used farm wagons.



Ursula Andress' voice in Dr. No was not her own. It was dubbed by Monica Van der Syl.



In James Bond movies, the gadget master who supplies Bond with all his gadgets, is referred to as Q. The Q stands for "Quartermaster."



In his seven appearances as Bond, Sean Connery says "shaken, not stirred" only once, in Goldfinger.



Tom Jones recorded the Thunderball theme, and fainted after singing the sustained high note at the song's climax.



Recycling a six-pack of aluminum cans saves the same amount of energy needed to drive a car five miles. Using recycled aluminum cans to produce new cans allows the aluminum can industry to make up to 20 times more cans for the same amount of energy.



**M.C. GILL FILLS ORDERS
TO EVERY CONTINENT
EXCEPT ONE...**

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THE FUNNY SIDE

A 6-year-old called his mother from his grandma's house and confessed he had broken a lamp when he kicked a football in the living room. "But, Mom," he said, brightly, "you don't have to worry about buying another one. Grandma said it was irreplaceable."



A young man who was an avid golfer found a few hours to spare one afternoon. He figured if he played extra fast, he could get in nine holes before he had to head home. Just as he was about to tee off, an old gentleman shuffled onto the tee and asked if he could accompany the young man. Not being able to say no, he allowed the old gent to join him.

To his surprise the old man played fairly quickly. He didn't hit the ball far, but plodded along at a good clip. When they reached the ninth fairway, the young man found himself with a tough shot. There was a large pine tree directly between his ball and the green. After several minutes of debating how to hit the shot, the old man finally said, "You know, when I was your age I'd hit the ball right over that tree."

With that challenge placed before him, the youngster lined up his shot, swung hard, hit the ball smack into the top of the tree trunk and it thudded back on the ground not a foot from where it originally lay. The old man allowed himself a slight smile, "Of course, when I was your age that pine tree was only three feet tall."



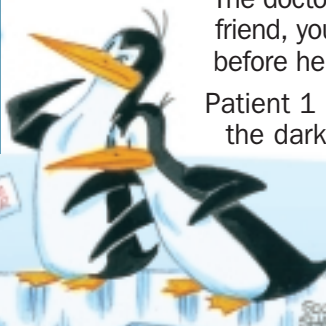
A doctor of psychology was doing his normal morning rounds when he entered a patient's room. He found Patient 1 sitting on the floor, pretending to saw a piece of wood in half.

Patient 2 was hanging from the ceiling, by his feet.

The doctor asked patient 1 what he was doing. The patient replied, "Can't you see I'm sawing this piece of wood in half?" The doctor inquired of Patient 1 what Patient 2 was doing. Patient 1 explained, "Oh. He's my friend, but he's a little crazy. He thinks he's a light bulb." The doctor looked up and noticed Patient 2's face was going all red.

The doctor asked Patient 1, "If he's your friend, you should get him down from there before he hurts himself."

Patient 1 replied, "What? And work in the dark?"



**...BUT WE'RE
WORKING ON THAT
ONE, TOO!**