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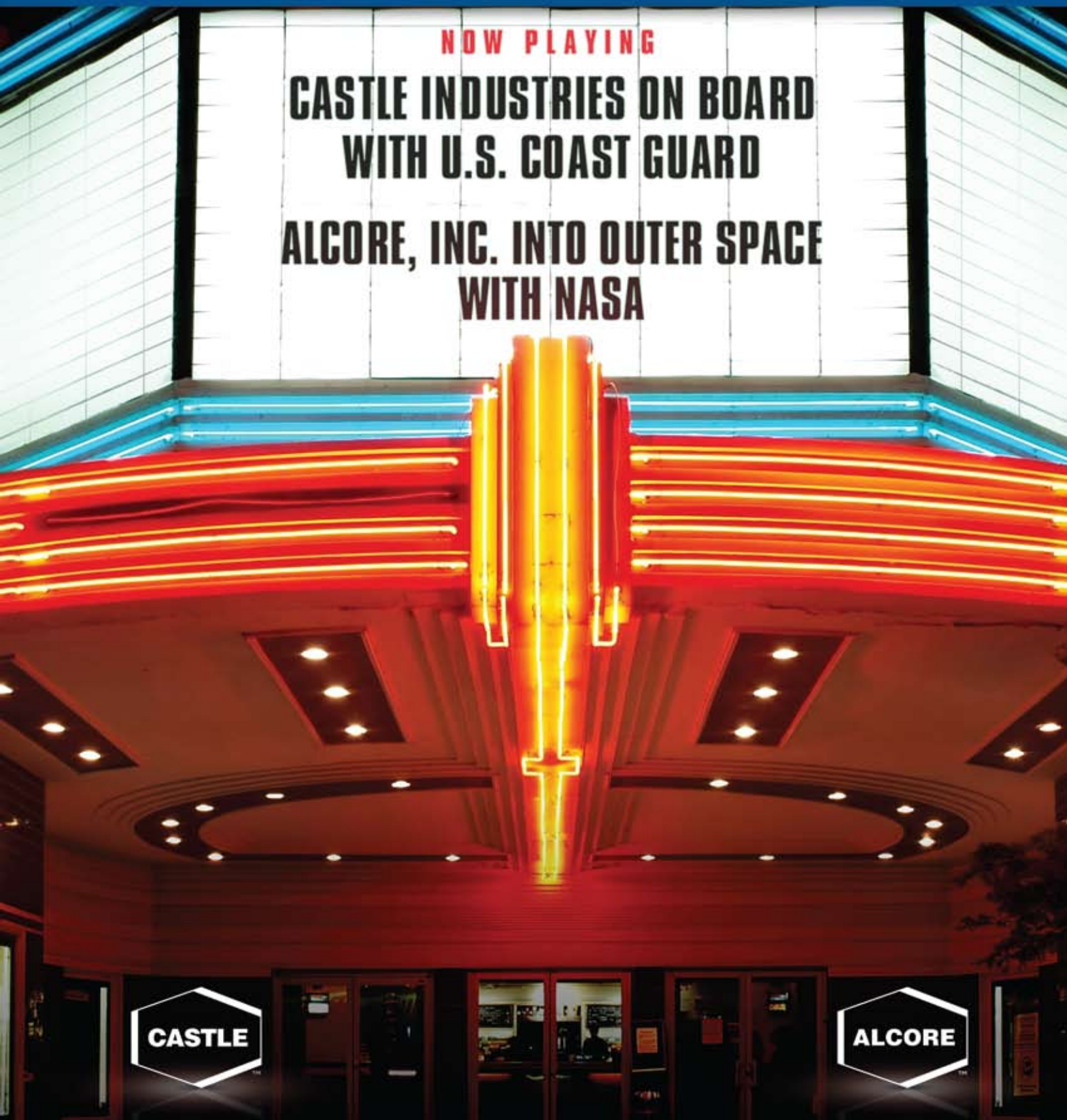


The Best Advances

Seats to the of Science

Open a newspaper, turn on the TV or log on to the Internet any day of the week and you are bound to see a story that could double as a script for a sci-fi movie. The scientific advances that are part of our world are both humbling and thought-provoking. We can't help but marvel at the latest military aircraft, medical advances and computer technologies. It is an exciting time to be an observer – but the employees at Castle Industries and Alcore, Inc. have a front-row seat.

CASTLE™ ALCORE™

Castle Industries and Alcore, Inc. are both subsidiaries of M.C. Gill Corporation. M.C. Gill Corporation subsidiaries (Alcore, Inc., Alcore Brigantine, Castle Industries and M.C. Gill Europe-Insoleq) are vertically integrated to ensure we are better able to serve our diverse customers' needs. A large number of the products and services we provide are destined for the commercial airline industry. However, we sometimes encounter projects outside our regular scope that bring exciting new challenges. Castle Industries is now involved in a project tied to the United States Coast Guard Integrated Deepwater System Program.

Castle Industries on Board with U.S. Coast Guard

The Deepwater Program is the 25-year program to replace all or most of the U.S. Coast Guard's equipment, including aircraft, ships, logistics and control systems.[1] Central to the program and the Coast Guard's capabilities is the HC-144A Ocean Sentry. The HC-144A is a transport and surveillance aircraft used to perform search and rescue missions, enforce laws and treaties, offer marine environmental protection, ensure military readiness, and conduct International Ice Patrol missions, as well as provide cargo and personnel transport. The Mission Systems Pallet (MSP) is the core of this fixed-wing turboprop aircraft. The MSP is a roll-on, roll-off suite of electronic equipment that allows the crew to compile data from the aircraft's multiple integrated sensors, and transmit and receive both classified and unclassified information to surface vessels, other aircraft, local law enforcement and shore facilities.

Castle Industries employees surround the structural housing for the MSP built at the Ontario, California facility.

After completion of a competitive bidding process, the contract for the HC-144A aircraft and Mission System Pallets (MSP) was awarded to Lockheed Martin. "The addition of these aircraft and Mission System Pallets to the Coast Guard's fleet will provide significant capabilities for the Coast Guard when responding to critical missions."[2]

The removable command, control, communications, computers, intelligence, surveillance and reconnaissance equipment allows two operators to control the aircraft's radar and Electro-Optical Infra-Red (EO/IR) sensors and communications equipment – collecting, managing and transmitting mission data. The requirement for a structural housing and protecting the highly sensitive equipment brought Lockheed Martin to Castle Industries.

1 Integrated Deepwater System Program, www.wikipedia.com
2 Mike Fralen, Coast Guard Aviation Lead; Lockheed Martin

Over the Ocean with the Coast Guard

Castle Industries, Inc. is located in Ontario, California. Castle Industries specializes in machined and formed metal parts, aircraft assemblies for commercial aircraft and military programs and fabricated parts that meet the rigorous standards of the aircraft industry. Castle Industries initially became involved in the Deepwater project with the award and completion of individual components (the center console and the electronic equipment enclosure) for the first three shipsets. The products were built and shipped on time, thus qualifying them

to compete for the next phase for the nine-shipset Integration Program. There were several competitors vying for the contract. Each was evaluated in the areas of price, project planning, project control, process/product quality analysis, configuration management, technical solutions, product integration, decision analysis, risk management, integrated project management and other related areas. After a careful review of the entire bid proposal and an audit of business practices by Lockheed Martin, Castle Industries was awarded the subcontract for the MSP integration program.

The finished MSP assembly consists of four main components. The first is the electronic equipment enclosure, which has a welded aluminum frame with aluminum closeout panels and a composite door made of M.C. Gill Corporation composite panels. The second component is the center console, which has aluminum details fastened together with rivets and screws. The last two components are the LH Workstation and the RH Workstation, which have aluminum details fastened together with rivets and screws. These components and other sub-assemblies are painted to match and mounted onto a pallet that Lockheed Martin provides. Once complete, the whole MSP assembly is packed and shipped to Lockheed Martin.

Bruce Brayshaw, General Manager at Castle Industries, says, "We're all very excited to be involved in this program. We have always had a good working relationship with Lockheed Martin and we have great respect for the services provided by the U.S. Coast Guard."

If you have questions about a project and feel that Castle Industries has the capabilities you seek, contact Castle Industries today to discuss your project:
Call **909-390-0899**
Email **info@castleindustries.net**.

Alcore, Inc. into Outer Space with NASA

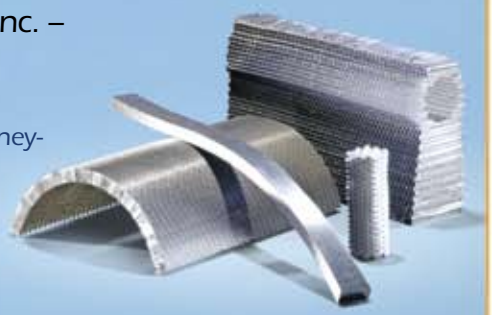
In Edgewood, Maryland, a group of engineers at Alcore, Inc. is working on a NASA project that is equally unique. NASA (National Aeronautical Space Agency) directs the Constellation program, which oversees the design for Orion – the Crew Exploration Vehicle that will replace the space shuttle for transporting crews to and from the International Space Station. Orion is a spacecraft designed by the United States space agency as part of the Constellation Program. Each Orion spacecraft is projected to carry a crew of four to six astronauts. The spacecraft is designed to be launched by the Ares I, a launch vehicle also currently under development. Both Orion and Ares I are elements of Project Constellation, which plans to send human explorers back to the moon by 2020, and then on to Mars and other destinations in the solar system.[3]

The craft is made up of the Launch Abort System (LAS), the Service Module (SM) and the Crew Module (CM). Although Orion will ultimately be constructed by Lockheed Martin Corporation, NASA developed an independent CM design as part of a smart buyer exercise. The current design is predominantly metallic, relying heavily on NASA's past experience with the Apollo program configuration. Early in 2006, the NASA Engineering and Safety Center assembled a team to examine the possibility of an alternative composite-dominated CM design.

Core section of the CCM (Composite Crew Module)

As part of this activity, NASA, Glenn Research Center personnel and contractors took the lead on designing and sizing a potential monocoque (supporting structural load by using an object's exterior, as opposed to using an internal frame) CM concept.[4]

The NASA Engineering and Safety Center (NESC) was charged with building the composite crew module. Although composites are widely used in the aerospace industry, incorporating composite technology into a space-rated vessel poses real challenges. The project dates back to 2006 when NASA asked the NESC to conduct a feasibility study to determine if a composite CM was a viable option. Part of the study was to identify a network of engineers within the NESC with hands-on experience using composites in a livable spacecraft design. In 2007, the NESC defined their goals to design, build and test a structural model to be developed with a group of civil service agencies with unique expertise in their fields. Representatives from Ames Research Center (ARC), Dryden Flight Research Center (DFRC), Glenn Research Center (GRC), Goddard Space Flight Center (GSFC), Johnson Space Center (JSC), Jet Propulsion Laboratory (JPL), Kennedy Space Center (KSC), Langley Research Center (LaRC), Marshall Space Flight Center (MSFC), Air Force Research Laboratories and a small group of private contractors – including Alcore, Inc. – are involved.

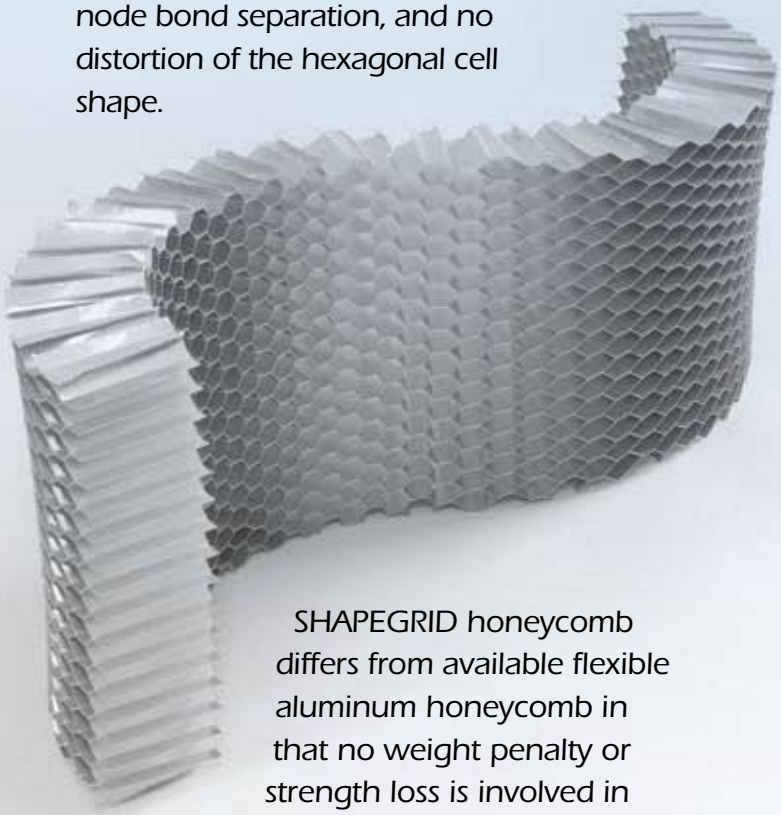


Shaped aluminum honeycomb components

3 Orion, www.wikipedia.com
4 Composite Crew Module Designed and Sized for Orion, www.grc.nasa.gov

Into Outer Space with NASA

Alcore brings its expertise in the area of aluminum honeycomb, with engineers Bob Boscia and Chad Nagel working directly with NASA engineers on this project. Alcore's engineers play an integral part in understanding the dynamics of incorporating aluminum honeycomb into the design. NASA is using SHAPEGRID aluminum honeycomb core as part of the CMM structure. SHAPEGRID™ Custom-Contoured Honeycomb is a rigid, contoured, hexagonal PAA-CORE or DURA-CORE aluminum honeycomb produced by the expansion process that conforms to a desired shape without the need for rolling, forming or carving operations. SHAPEGRID exhibits no cell wall damage, no node bond separation, and no distortion of the hexagonal cell shape.



SHAPEGRID honeycomb differs from available flexible aluminum honeycomb in that no weight penalty or strength loss is involved in utilizing its shape-conforming capability. The established relationships of alloy, density, and mechanical properties remain unchanged from those of standard flat-panel aluminum honeycomb.

Alcore introduced the industry to PAA-Core CORE aluminum honeycomb back in 1988. Using a phosphoric acid anodized (PAA) metal treatment process, the product is a highly corrosion-resistant aluminum honeycomb core with excellent bonding capability and durability. It is an accepted replacement for non-metallic core with an outstanding record. One of its distinctions is a high strength-to-weight ratio. Over a decade of operational experience has shown that bond durability between core and skins is critical to long part life, and for this PAA-CORE has no equal. Independent analysis confirms the environmental performance durability of PAA-CORE, assuring a lower total life cost than with other core materials. PAA-CORE also has unsurpassed corrosion resistance, experiencing only minimal weight loss and virtually no loss of physical properties after extended exposure in an acidified salt spray chamber, which simulates the harshest environmental conditions.

The NESC would take advantage of their team of experts and the vast engineering data developed by the Constellation program in the development of the CCM. The CCM team operates in a virtual environment where they communicate with each other electronically across geographic borders. The original design was constrained to match the actual Orion crew module, with the first couple of months dedicated to evaluating design solutions with an emphasis on aluminum honeycomb sandwich and solid laminate material systems. As the project progressed, several unique features emerged related to structural design,

Chad Nagel and Bob Boscia of Alcore worked closely with NASA

resulting in significant weight savings. An independent review of the team's findings propelled the project towards the next step of statistical tests and then verification of their analysis. Their comprehensive review included materials, general analysis, manufacture and tooling and non-destructive examinations findings. Where the team goes next is limited only by the imagination.

The experience has been challenging and has opened doors for Alcore. Alcore is now providing aluminum core for the Ares I and Ares V in conjunction with NASA and ATK. Their most recent projects are for barrel sections on both rockets that will be used to launch the Orion and other payloads into space. Projects like these have a sci-fi feel to them but they are all part of another days' work for the engineers at Alcore.

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

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Trivia

Men can read smaller print than women can; women can hear better.

Coca-Cola was originally green.

The cost of raising a medium-size dog to the age of eleven: $16,400.

The first novel ever written on a typewriter: *Tom Sawyer*.

The San Francisco cable cars are the only mobile National Monuments.

Each king in a deck of playing cards represents a great king from history:

Spades – King David
Hearts – Charlemagne
Clubs – Alexander the Great
Diamonds – Julius Caesar

Q. What do bulletproof vests, fire escapes, windshield wipers and laser printers have in common?

A. All were invented by women.

The Funny Side

A guy is driving around the back woods of Montana and he sees a sign in front of a broken-down shanty-style house: "Talking Dog for Sale." He rings the bell and the owner appears and tells him the dog is in the backyard. The guy goes into the backyard and sees a nice-looking Labrador retriever sitting there.

"You talk?" he asks.

"Yep," the Lab replies.

After the guy recovers from the shock of hearing a dog talk, he says, "So, what's your story?"

The Lab looks up and says, "Well, I discovered that I could talk when I was pretty young. I wanted to help the government, so I told the CIA. In no time at all they had me jetting from country to country, sitting in rooms with spies and world leaders, because no one figured a dog would be eavesdropping.

"I was one of their most valuable spies for eight years running. But the jetting around really tired me out, and I knew I wasn't getting any younger, so I decided to settle down. I signed up for a job at the airport to do some undercover security, wandering near suspicious characters and listening in. I uncovered some incredible dealings and was awarded a batch of medals.

"I got married, had a mess of puppies, and now I'm just retired."

The guy is amazed. He goes back in and asks the owner what he wants for the dog.

"Ten dollars," the owner says.

"Ten dollars? This dog is amazing! Why on earth are you selling him so cheap?"

"Because he's a liar. He never did any of that stuff!"

YOU KNOW YOU ARE LIVING IN 2010 when...

1. You accidentally enter your PIN on the microwave.

2. You haven't played solitaire with real cards in years.

3. You have a list of 15 phone numbers to reach your family of three.

4. You e-mail the person who works at the desk next to you.

5. Your reason for not staying in touch with friends and family is that they don't have e-mail addresses.

6. You pull up in your own driveway and use your cell phone to see if anyone is home to help you carry in the groceries.