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# Automotive to Aerospace: What to Consider

By Gavin Brown

It is no secret that diversification is an essential strategy to today's mold manufacturers—especially those with heavy involvement in the automotive industry. As a result, automotive mold manufacturers may want to consider branching out into the aerospace market—for tooling, production machining and precision-molded plastics. Both industries have quality requirements, although aerospace standards are more stringent and different materials are used to build the molds. Moldmakers who diversify into aerospace find the barriers to be one of tight tolerance work that can be held over large areas of material, and material that they may not be accustomed to. It is important to be aware of the differences before you consider diversifying.

Aerospace opportunities can range from complex injection molded components such as electrical connectors and intricate devices for servicing electronics inside the planes, high-precision tooling, large tools for composite fuselage parts, high-speed precision machining, welding, CMM inspections, and fab or fixture building.

**Material Complexities**
Tooling for the aerospace industry can be stainless steel, aluminum, titanium, nickel-based alloys, etc. Programs exist in new commercial planes, composite and traditional aluminum exteriors and military, especially UAVs. Composite parts are used in new plane construction on the Airbus 380 and the 787. During the mold build process the metals used for aerospace molds have complexities that do not come into play when building automotive molds. There also is a trend toward more lay-up tooling as opposed to traditional moldmaking. Lay-up tooling can be manufactured in a variety of materials, and involves a single surface that resin-impregnated composite material layers can be laid upon.

**Longer Timeframe**
Automotive moldmakers also need to understand that in the aerospace industry, when there is a new model changeover, the timeframe can be up to two years versus the one year or less timeframe that usually occurs in the automotive industry. In the aerospace industry, changes involve engineers proving their change will not have a negative impact on all other aspects of flight safety and performance. So, molds are often modified after testing and the timeframe for this process is longer and more extensive, due to the air-worthy certification process.

**Stricter Standards**
Aerospace tolerances are much stricter than automotive. For example, a rivet for an aircraft frame can have as low as 0.001 of a variance, as compared to a tolerance in the 0.1 range or slightly better for the automotive industry. As for quality standards, AS9100—released in October 1999 by the European Association of Aerospace Industries and the Society of Automotive Engineers—is the program the aerospace industry has adopted worldwide when it comes to producing production parts for aerospace components, not tooling. Contacting the International Aerospace Quality Group (iaqg.org) is a good starting point. Achieving this certification doesn't guarantee you will get aerospace business, but it does qualify you so that aerospace manufacturers will start looking at you. Companies like Boeing won't even consider you if you don't have this certification.

**Equipment Needs**
Automotive moldmakers who possess state-of the-art equipment should be able to easily adapt to the aerospace industry. Equipment should be able to handle a larger dimension/area, like an airplane wing for example. Aerospace moldmakers' capabilities range from composite lay-up tooling to the advanced large gantry machines that can produce large scale metal frame parts that can vary in length up to 46 feet.

**A Long Road**
Many moldmakers might expect a seamless integration into the aerospace industry; however, it is not a quick fix. Two years is considered quick to get qualified. It is a strategic decision. Familiarize yourself with the standards. Contact trade associations, and find other mold manufacturers who have made a successful transition. Then you will be better equipped to make a decision.

Aerospace molds have to be dead-on right, and it's a learning process to understand the industry and its demands and complexities—it's not just a matter of building a different mold. This is a risk-adverse business; and to get this business, the moldmaker needs to take the risk away from the buyer and demonstrate an understanding of the demands of aerospace.

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