

Aerospace Fasteners and U.S. Market

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Aerospace Industry

The overall global aerospace and defence industry is expected to grow in the 3.0 percent range in this year. This would be similar to the growth likely in 2014, all of it and more due to the rising fortunes of the commercial aerospace sector. The global commercial aerospace sector is expected to sustain its significant revenue and earnings growth in 2015, underlined by extended record-setting production levels both at the platform and in the supplier base.

This growth is likely to be driven primarily by increased production rates due to the accelerated replacement cycle of obsolete aircraft with next generation fuel-efficient aircraft, as well as the continued increases in passenger travel demand, especially in the Middle East and the Asia-Pacific region. On the other hand, continued declines in revenues are expected for the global defence. The United States (U.S.) defence budget is a key driver of this decline, as sales revenues lag outlays, appropriations and budget authorizations, despite calls for increases in defence spending. The chart below exhibits the global spending in aerospace and defence industry.

US Aerospace

The U.S. aerospace industry directly employs about 500,000 workers in scientific and technical jobs across the nation and supports more than 700,000 jobs in related fields. Investment in the U.S. aerospace industry is facilitated by a large pool of well-trained machinists, aerospace engineers, and other highly-skilled workers with experience in the aerospace industry.

As mentioned earlier, the U.S. spends considerably the most on defence with 39 percent of the total global spend. Thus, any changes in the U.S. defence budget will have a significant impact on the global market. In November 2014

the U.S. defence announced a new strategy for addressing the increasing technology advances of rivals. It is expected that the defence industry would have business opportunities to research, develop, and field these technologies should there be a business case and projected return on investment.

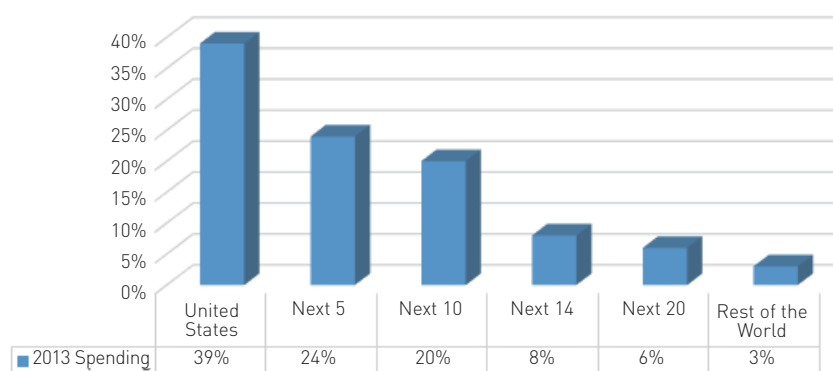
US is a global leader in large civil aircraft production and offers many opportunities for investment in the sector. The companies in the U.S. commercial space market are major suppliers to the U.S. Government programs, where demand has remained stable during the commercial aerospace and global economic downturns. Besides the world's largest market for General Aviation (GA) aircraft is in the U.S. Manufacturers produce a wide range of GA products including piston aircraft, turboprops, jets, balloons, dirigibles, and experimental aircraft. Major engine and power plant manufacturers are typically part of diversified corporations producing engines for both civil and military aircraft, either alone or as part of one or more joint ventures. Engines and power plant sales also provide maintenance, repair and overhaul business opportunities.

The United States has a robust aerospace supply chain with capabilities in maintenance, repair, and overhaul (MRO), composites, metal-working, avionics, testing equipment, and coatings. U.S.-based suppliers are highly sought after partners for aerospace manufacturing programs at home and abroad.

Aerospace Fasteners

When talking about aerospace industry and aircraft parts, what are the first things that people think of? Turbine engines, electronic control devices, landing gear, seats, wings, and so on and so forth. In other words the big, visible, high tech and expensive parts of the aircrafts. But even the production of a multimillion airplane can be stopped due to the most costly part: a fastener.

Top 50 Aerospace and Defenders Spenders



Next 5 - China, Russia, France, Japan, United Kingdom

Next 10 - Saudi Arabia, India, Germany, Brazil, Italy, South Korea, Australia, Canada, United Arab Emirates, Turkey

Next 14 - Israel, Spain, Oman, Netherlands, Colombia, Taiwan, Iran, Poland, Algeria, Singapore, Indonesia, Pakistan, Norway, Mexico

Next 20 - Sweden, Greece, Kuwait, Iraq, Belgium, Thailand, Chile, Switzerland, South Africa, Malaysia, Denmark, Ukraine, Argentina, Portugal, Egypt, Venezuela, Angola, Morocco, Austria, Finland



Fasteners account for a significant amount of parts in aircraft which directly impact the strength and weight of most of structural assemblies. For instance, according to the Boeing Company, the Boeing 747 includes over six million parts, half of which are fasteners. As the Industry evolves to incorporate newer, more exotic materials, fasteners continue to figure prominently in the manufacturing and assembly processes. Fasteners play a critical role in defining the longevity, structural integrity, and design philosophy in aerospace industry in general and most metallic aircraft structures in specific.

Aerospace fasteners are screws, bolts and other fastening tools made specifically for use in aircraft construction. Created through processes such as warm heading, cold heading and forging, these types of industrial fasteners are also used to hold landing gear, fuselage access panels and all other types of aircraft equipment.

All equipment, fixtures, pieces of furniture and other components on an aircraft must be secured in order to ensure safe flight. On commercial airliners, passenger seats must be bolted together and to the aircraft itself. In military aircraft like fighter jets, explosive bolts (also called pyrotechnic fasteners) or other advanced or specialty fasteners are used to secure ejectable canopies. Specialty fasteners are certain varieties of fasteners that are manufactured for a specific industry, job or material. In comparison to general purpose fasteners, specialty fasteners' applications are limited and specific. In aircraft intended for use in zero gravity situations, as is the case in high-altitude research aircraft and space exploration vehicles, fasteners are essential for securing equipment. There are a few similarities between threaded aerospace fasteners and automotive fasteners.

While aerospace fasteners manufactured in the United States are available in strength grades, automotive fasteners are categorized in diameters. Steel and stainless steel are almost always used in the manufacture of automotive fasteners, while titanium is more common in aerospace applications.

US Aerospace Fastener Market

The global market for aerospace fasteners is projected to reach \$6.8 billion by the year 2018, encouraged by increased shipments of aerospace equipment and the growing trend towards large sized aircrafts. The global aerospace industry in general and the US fastener market in specific is influenced by several economic and political factors. Further, governmental initiatives, in the form of increased investments in non-building construction, military and commercial aircrafts and satellites, are fuelling demand for aerospace grade fasteners.

Technologically sound, high-performance specialty aerospace fasteners and application-specific standard fasteners are poised to achieve robust growth over the coming years in the U.S. Although the economic recession in the U.S. within the aerospace industry prolonged for few years

and weighed down significantly on fastener manufacturing, today, the U.S. aerospace fastener industry constitutes a major segment of the industry. It has a large number of varied companies centered around the main purchasers of aerospace fastener products.

Generally developed markets of Europe and United States represent leading regional markets, capturing substantial share of the global market. With domestic consolidations creating some of the largest companies worldwide with enhanced capabilities and huge production base, the US and European markets are expected to continue their dominance over the industry.

Some Technical Matters

The aerospace industry utilizes all sorts of standard fastener types, including screws, rivets, bolts, pins, collars and many more. The key difference is quality. Aerospace products need to be more durable in order to withstand a lot of high pressure and temperature environments, such as leaving the earth's atmosphere or exposure to burning rocket fuel. Additionally, aerospace products must be lightweight. This helps with lift for planes and fuel costs for rockets. As a result of these concerns, research and development teams working for the government and private companies have created many types of equipment and metal treatment methods in order to get high quality fasteners.

There are a variety of aerospace fasteners. Some contain spiral ridges called threads that aid in the attachment of the fasteners. Continuous-thread studs, with two nuts applied, are used for flange bolting and are threaded from end to end. Tap-end studs, in contrast, have a short thread on one end, used for screwing into a tapped hole, and a longer thread on the other. This longer end is called a nut-end and may have either a chamfered or round point. Another variation of aerospace fasteners are those with double-end studs, which have equal-length threads on both ends with chamfered points. Double-end studs are used for flange bolting or other applications in which torching from both ends is necessary. Other types of aerospace fasteners include sheet metal industrial fasteners,

riveting industrial fasteners and clinching industrial fasteners. A wide variety of head options, which determine how the aerospace fastener will sit against the material, are available. The type of head also affects the required length of the aerospace fastener. Environmental conditions to which the fasteners may be subjected, such as temperature, moisture, and ultraviolet radiation, should be considered. Other important considerations include the chemicals or other corrosive substances to which the aerospace fasteners may be exposed as well as the decorative properties required by the fastener itself, if any.

Sources

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