Advanced Materials Science and Processing

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Editorial

Advanced Materials Science and processing is the study of all of the materials we see around us every day. Materials Science or Engineering forms a bridge between the sciences and engineering. It allows theory to be put into practice in a way which benefits everybody. Materials Scientists or Engineers look at all of the different groups of materials, metals and alloys, polymers, ceramics and composites. They develop new materials for new applications, improve existing materials to give improved performance and look at ways in which different materials can be used together. Advanced Materials Science and processing is designed to offer comprehensive sessions that address recent advancements and new strategies for development of new materials for global requirements with an objective to install a dialogue between industries and academic organizations and knowledge transfer from research to industry. Glance at Market of Advanced Materials and processing: Advanced materials and processing category covers a range of industries including ceramics, glass, metals, alloys, construction materials and other high technology processing areas. The global market for coated flat glass totalled $24.3 billion in 2015, and should total nearly $25.8 billion in 2016 and $34.4 billion by 2021 at a five-year compound annual growth rate (CAGR) of 5.9%, through 2021. The scope of this report is broad and covers coated flat glass, different types of coating technologies and their applications. The market is broken down by coating technologies, applications and regional market. Revenue forecasts from 2016 to 2021 are given for each major type of technology, application and regional market. Estimated values used are based on manufacturers' total revenue. The global market for 3-D printing materials reached $475.4 million in 2015. This market is expected to reach $576.6 million in 2016 and over $1.5 billion in 2021, registering a compound annual growth (CAGR) of 21.5% over the next five years,. The market size of composites in oil & gas industry was USD 1.48 Billion in 2015 and is projected to reach USD 1.98 Billion by 2021, registering a CAGR of 5.05% between 2016 and 2021. In this study, 2015 is considered as the base year and 2016–2021 as the forecast period for the market composites in oil & gas industry.Markets and Markets projects that the polyurethane foam market size will grow from USD 46.05 Billion in 2015 to USD 74.24 Billion by 2021, at a CAGR of 8.4%. The base year considered for the study is 2015 and the market size is projected from 2016 to 2021. In the composites industry, one of the best ways to judge success is to look at end product demand. The demand for composite end products – ranging from utilitarian underground pipes to high-performance aircraft – reached $21.2 billion in 2014 and stayed the course in 2015, reaching $22.2 billion. Looking ahead, the key economic indicators and market dynamics suggest 2016 growth at approximately 5.4 percent to reach $7.9 billion. Approximately 5.7 billion pounds of composite materials were shipped in the U.S. in 2015 and that number is forecast to grow to 6.9 billion pounds in 2021 at a compound annual growth rate (CAGR) of 3.2 percent. The introduction of safety norms in public transport as well as increasing demand for lightweight and high-performance composite materials in the aerospace & defense, transportation, and energy & power applications are key factors responsible for the growth of the hightemperature composite materials market. Global Metallurgy market will develop at a modest 5.4% CAGR from 2014 to 2020. This will result in an increase in the market's valuation from US$6 bn in 2013 to US$8.7 bn by 2020. The global market for powder metallurgy parts and powder shipments was 4.3 billion pounds (valued at $20.7 billion) in 2011 and grew to nearly 4.5 billion pounds ($20.5 billion) in 2012. This market is expected to reach 5.4 billion pounds (a value of nearly $26.5 billion) by 2018. Projected Market Growth of - Advanced Materials and processingAdvanced materials can be defined in numerous ways; the broadest definition is to refer to all materials that represent advances over the traditional al materials that have been used for hundreds or even thousands of years.

Market size figures are available for traditional materials, but are usually unavailable for emerging technologies (see Figure 1 below). If values are available for emerging technologies they are often based on the opinions of experts, rendering the forecasts as more of a guidepost than a decision making tool 2. However, the market size for traditional materials is important, since it offers an indication of the potential market for advanced materials that replace traditional. From the figure, one can see that the market for traditional materials is fairly flat in terms of $ sales. However, it is important to take into account the dematerialization of most products. Over time products are providing the same level of benefit and value through the use of less material. In some cases this is the result of better use of existing materials. In other cases, dematerialization is driven by the use of smaller quantities of more expensive (on a per unit basis) advanced materials. The worldwide production of steel is about 780 million metric tons annually 4. In 2002, the North American aluminium supply was 10 million metric tons (5.2% above 2001) 5 and the European aluminum market was about 7 million metric tons in 2003 6. The aluminium market is currently supplied by a mixture of secondary (metal from recycling) and primary (virgin material) production. Markets for polymers, both thermoplastics and thermosets, are large and continue to grow 7. Since composites are a combination of other materials their volumes are included in the values reported above. Having given an indication of the size of the global materials markets, the manner in which economic value can be extracted from materials is considered. Composites in oil & gas industry: The market size of composites in oil & gas industry is projected to reach USD 1.98 Billion by 2021, at a CAGR of 5.05% between 2016 and 2021. The increasing demand for non-corrosive and lightweight materials in the oil & gas industry and low maintenance cost of composites are the key drivers of the global market of composites in oil & gas industry.

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