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LIGHT WEIGHT MATERIALS IN THE TRANSPORTATION INDUSTRY: CHALLENGES AND OPPORTUNITIES

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Abstract

In the transportation industry the global use of lightweight materials (LWM) in 2006 was 42.8 million tons. This figure is expected to reach 68.5 million tons by 2011, a compound annual growth of 9.9%. The aircraft industry was the first to introduce aluminum alloys in a widespread basis in 1920s, followed by the introduction of composite materials. This trend was then adopted by the automobile industry in the 1990s and later by the shipbuilding industry. The approach of reducing weight by downsizing in order to meet stringent fuel consumption requirements, yet meeting safety standards and consumer preferences has reached its limits and one needs to focus on other alternatives. One of these is the development of strong, tough, stiff, environmental friendly, cost effective and reliable LWM materials, using a system design approach. Another is the development of hybrid materials, and yet another one is the development of hybrid vehicles.

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