

## **Magnesium (Nanocomposite) Technology for Greener Transportation Sector**

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Magnesium is the lightest structural metal in the periodic table and sixth most abundant material in the earth's crust that can be used in weight critical applications at an affordable cost. Magnesium based materials can provide further 30-35% weight saving over aluminium based materials in transportation sector. Besides, magnesium possesses several other benefits like excellent castability, high damping capacity, good electromagnetic shielding, excellent machinability and less energy requirement in production compared to aluminium. From environmental perspective, fuel savings and reduced emission of greenhouse gases is the natural outcome expected if magnesium based materials are actively used. Use of magnesium based materials thus can assist in meeting the target of reducing greenhouse gas emissions by 30-40% by year 2020. Moreover, magnesium is one of the metals that is naturally found in human body and so it can be categorized under green metals category unlike aluminium which can lead to Alzheimer disease, if consumed. Accordingly, due to abundance and non toxic nature of magnesium, magnesium technology is sustainable for engineering applications. In view of the multiple advantages of magnesium, efforts are made to synthesize magnesium based nano composites using energy efficient solidification and microwave assisted processes. Results obtained so far indicate that nano-size reinforcements have significant potential in enhancing tensile, compressive, dynamic, fatigue, high temperature strength retention, machining and ignition properties. In addition, oxidation and wet corrosion properties can also be enhanced using nano- size reinforcements which are also very critical for structural applications. In view of the positive results obtained so far, efforts are made to upscale the solidification processing technique to pilot plant level and to integrate new magnesium based materials in selected engineering applications.