

## LOW DIMENSIONAL FILLERS FOR NANOSTRUCTURED COMPOSITES

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Our team at UFMG has been working since 2008 on the research and development focuses on nanotechnology for the energy supply chain, in particular with the use of carbon nanomaterials integrated in polymer matrices. Examples of advanced materials for increasing the efficiency of the conventional source of fossil fuel energy are epoxy systems with carbon nanotubes and graphene. These materials extend the temperature limit of use and show increased stiffness and toughness with the addition of minimum amounts (<1% by mass) of low dimensional fillers. The reduction of failures and periodic maintenance in the oil and gas exploration and production facilities, especially in the context of deep water exploration, is the main motivation.

Minimizing energy losses is as relevant as exploring new energy sources that are less impacting to the environment. Industrial activities in general and also domestic ones should be optimized to minimize energy losses. Seen from this angle, reducing friction, preventing corrosion, increasing resistance to use in aggressive conditions, decreasing mass and dimensions of parts, improving thermal insulation, among others, we are contributing to the global energy problem. Our group is involved in building up a technology center at the technological park (BH-Tec) in collaboration with researchers from different departments of UFMG. The challenge is the scale-up and the batch production of polymer nanocomposites to work objectively on innovations of national interest that minimize energy losses.

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