

# An Analysis of Glass Fiber Reinforced Polyamide 66 and PTFEs Tribological Performance

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**Abstract:** Thermoplastic polymer composites are widely used as structural materials in automotive, manufacturing, aerospace and chemical industries to provide lower weight alternatives and self lubrication to traditional metallic materials. These applications in the many industry sectors are concentrated on tribological machine parts, such as gears, cams, bearings and seals, due to their many advantages of polymer composites as self lubrication. The main advantages of these polymers are high wear resistance, cost, weight, silent operation and manufacturability at non-lubricated dry conditions in journal bearing materials.

To meet the combination of light weight and high strength demands polymer-based materials are increasingly applied in many industries. PA66 has been reported to have superior wear resistance to other polymers due to its ability to form a thin and uniform transfer film while sliding against steel counterparts. However, these polymer materials have low mechanical properties, such as low mechanical strength, low thermal conductivity and large thermal expansion. Therefore PA66 polymer bearings have limited the wide applications. In order to overcome these low mechanical properties of neat polymer, reinforcement fiber are usually embedded in polymers to make composites. Glass fibers which are short fiber reinforcements have been successfully used to improve the strength to high pressure, high load carrying capacities and stiffness. In addition, to effectively reduce the coefficient of friction of journal bearings, PTFE additives are embedded in PA66 composites. PTFE has low coefficient of friction and high thermal stability.

**Keywords:** Additives, Polyamide, polymer, Sliding Wear

