# Wear Resistant Material Solutions Guide

Our solutions provide improved wear resistance and lower friction by combining resins with lubricants such as PTFE, Silicones, Aramid Fiber, Graphite, Molybdenum Disulfide, and other additives. These additives can extend product life and reduce or eliminate squeaks and other noises from moving parts.

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**Disclaimer:** The product suggestions outlined above may are meant to be general suggestions. Each application should go through a thorough material selection assessment by a Conventus Polymers representative prior to purchase.

*Unique PEEK contract allows us to provide PEEK based compounds at 30% or more less than leading competitors.*
PTFE
Polytetrafluoroethylene (PTFE) has the lowest coefficient of friction of any known internal lubricant. The molecular weight and particle size of the PTFE lubricant is important to optimize a resin system for each application. PTFE functions under shear by creating a film over the thermoplastic surface. This films transfer to the mating surface providing a lubricated film on the composite or metal surface. Generally, optimal PTFE loadings of 15% in amorphous and 20% in crystalline materials provide the lowest wear rates. PTFE alone requires a break in period.

Silicone
Silicone acts as a boundary lubricant. It migrates to the surface of the part due to its limited compatibility with the resin. Thus, there is a continuous generation of silicone film which serves as a lubricant. A PTFE/silicone system provides immediate and long term wear resistance.

Graphite Powder
Wear resistance of graphite lubricated fibers falls between unfilled thermoplastics and PTFE/Silicone lubricated plastics. It’s primary use is in applications operating in water based environments. Thus it is commonly used in water meter components or dirty water flues.

Molybdenum disulfide
Moly acts as a nucleating agent, which enables the molded part to have a fine crystalline structure. Moly lubricated composites have been commonly used to reduce slip-stick in bearing applications.

Aramid Fiber
Aramid Fibers provide the most wear resistance out of all the reinforcing fibers added to plastics. The primary advantage is when the counter wear surface is a soft metal such as brass, aluminum, or bronze. Aramid is softer than both Carbon and Glass Fiber.

Glass Reinforcement
Glass reinforcement improves the mechanical properties of resins. Generally, glass reinforcements increase frictional coefficients and counter surface wear. When combined with PTFE and/or silicone the system provides excellent lubrication and mechanical strength.

Carbon Fiber
Carbon Fiber has dual benefits providing greater mechanical property increases than an equivalent amount of glass and they can significantly increase thermal and electrical conductivity. Unlike glass, carbon is softer and less abrasive. Electrostatic charge dissipation can occur in composites containing 10-15% more carbon fiber reinforcement.