

Fluon™ PTFE Micropowders Outperform Conventional Lubricant Additives for Rubber Compounds

Many natural rubber and synthetic elastomer products used in the automotive and consumer durable industries are compounded with lubricating additives for improved tribological performance as well as processing advantages. Products like O-rings, hoses, fan belts, strips, seals and gaskets require tear resistance, abrasion resistance and lower surface friction. Intricate elastomer shapes require improved mold release, while other products require the elimination of stick-slip during processing.

Conventional lubricant additives have significant performance and cost issues. For example, waxes, stearates, soaps, plasticizers and oils are often extracted by lubricating oils, fluids and aqueous solutions. Conventional solid lubricants like graphite and molybdenum disulphide require such large quantities that they can negatively impact the final product's strength and wear resistance. AGC's Fluon™ PTFE micropowders provide a superior alternative to conventional lubricant additives in terms of both cost and performance.

PTFE micropowders can be added to natural rubbers and synthetic elastomers during processing to provide the following surface slip characteristics:

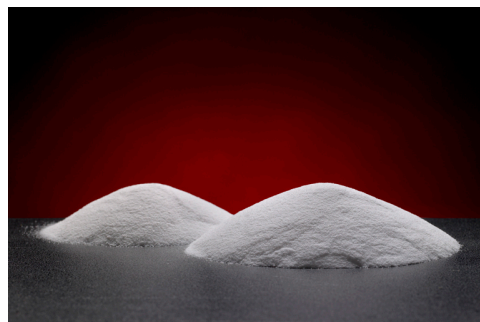
- Improved mold release
- Non-extractable, solid, inert internal lubrication
- Increased abrasion resistance and lower surface friction resulting in reduced wear
- Elimination of stick-slip
- Improved tear resistance



PTFE micropowders have been used successfully in the composition of dynamic window and door seals to eliminate stick-slip, improve wear resistance and reduce noise. Only a small amount (2 to 5 percent) of the additive is required to provide ideal surface friction, and improvements are more pronounced with harder rubbers (60A or greater).

Another proven application is laminating rollers used with adhesives. PTFE micropowder-filled nitrile rubber can effectively replace silicone rubber, providing improved release and better tear strength at a lower cost. Compounders have achieved similar improvements with other materials including styrene butadiene rubber, silicone, polyurethane and fluoroelastomers.

PTFE lubricant powders are also used to improve mold release properties and reduce rejection rates in intricate moldings. When dry-mixed with other fillers before compounding, elastomer products release easily, which results in reduced rejection rates. The powders remain inert to all chemicals during processing and will neither interact with nor absorb any of the formulation ingredients.



Preferred Fluon lubricant grades include:

- *Fluon FL1690* is a granular PTFE micropowder with an optimized particle size distribution and high bulk density for optimal mixing in low-friction rubber compounds. It is a general-purpose grade used in O-rings, gaskets, hoses, roll covers, belts, etc.
- *Fluon FL1650* is similar to FL1690, but with reduced surface acidity preferred for use in high-purity rubber compound applications such as autoclave door seals and food contact belting or seals.
- *Fluon FL1700* is a coagulated fine powder PTFE Micropowder that typically can be added for improved tear resistance and lubrication in seals.

All of the above PTFE micropowders are compliant with FDA 21 CFR 177.1550 - PERFLUOROCARBON RESINS, which may be safely used as articles or components of articles intended to contact food. They are also compliant to FDA 21 CFR 175.300 - RESINOUS AND POLYMERIC COATINGS, which may be safely used as the food-contact surface of articles intended for use in producing, manufacturing, packing, processing, preparing, treating, packaging, transporting or holding food.

About AGC Chemicals Americas Inc.

AGC Chemicals Americas Inc. is a wholly owned subsidiary of Asahi Glass Company Ltd., a \$13 billion multinational corporation and one of the world's largest manufacturers of glass, electronic displays and chemical products. The company was formed in 2004 through the merging of sister companies Asahi Glass Fluoropolymers USA and AGA Chemicals. Headquartered in Exton, Pa., AGC Chemicals Americas maintains manufacturing operations in nearby Thorndale, Pa., and warehouses located throughout North America.

www.agcchem.com

###

