

STREAMLINE

Paratherm Application Series

Fluoropolymer Compounding Relies on Heat Transfer Fluid For Precise Temperatures

APPLICATION SERIES

Company:	AGC Chemicals Americas
Location:	Downingtown, Pa
Application:	Fluoropolymer Compounding
Heat Transfer Fluid:	Paratherm NF®

Downingtown, Pa. – The acquisition of a two-roll milling machine in March 2003 enabled the new U.S. Aflas® Technical Center of AGC Chemicals Americas to develop fluoroelastomer and Fluon® melt processable fluoropolymer compounds for new applications. Since the production of fluoroelastomer and fluoropolymer compounds requires heat tolerances as precise as plus/minus 5°F, it is critical to control the roll temperature in cooling or heating modes.

“In elastomer compounding,” Laboratory Manager David J. Lavanga said, “excess heat generated by the shear

forces of the counter rotating rolls is removed by cooling the rolls to promote good handling and reduce sticking. Also, in the heating mode the mill temperature of various fluoropolymer compounds needs to be maintained at high temperatures where Paratherm NF® excels. The heat-transfer fluid is crucial to temperature control of the roll mill.”

In order to manage the broad temperature range effectively, the supplier who furnished the two-roll milling machine to AGC recommended Paratherm’s NF (non-fouling) heat transfer fluid for the machine’s heating and cooling unit. Paratherm NF withstands the temperature extremes that fluoropolymers require with efficiency, safety and cost effectiveness.

The AGC laboratory, located in Downingtown, Pa., in suburban Philadelphia, develops pilot compounds for automotive, wire and cable, petrochemical, industrial and aerospace applications.



The rolling mills at AGC Chemicals America are used to compound the fluoropolymers that are an essential component in certain data cables and other wire and cable applications, as well as automotive and industrial seals and gaskets and down-hole oil and gas applications.

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Laboratory Manager David Lavagne of AGC Chemicals America checks the functioning of the two rolling mills which rely on non-toxic, non-fouling Paratherm NF heat transfer fluid. Product quality and consistency at AGC is extremely high. Lavagna attributes this to the precise, uniform temperature control that the NF fluid consistently delivers.

"The success rate of the pilot compounds is high," Lavagna said. "Fluoropolymers provide superior properties for high-speed data cables and other wire and cable applications, as well as automotive and industrial seals and gaskets and down-hole oil and gas applications."

Resistance to heat and harsh chemicals, low-conductivity, low friction and non-flammability are among the properties that make fluoropolymers effective in a wide variety of applications. AGC's compounds employ unique filler systems, making the use of roll-milling machines advantageous for the development of these compounds.

"These types of compounds may tend to be abrasive," Lavagna said, "which can wear out the internal parts, such as the screw and barrel of an extruder. Roll-milling machines, on the other hand, are utilized externally, which inherently reduces wear."

The use of Paratherm heat transfer fluid provides a greater range of temperature, enabling the roll-milling machine greater flexibility in the range of compounds it produces. As an example, manufacturing ETFE compounds and alloys requires temperatures of at least 275°C.

"Paratherm NF maintains tight temperature tolerances," Lavagna said, "enabling us to develop compounds that meet our customers' quality requirements. With Paratherm's NF, we also eliminated all fouling problems."

Among the products AGC produces with the roll milling machine are Aflas® fluorinated elastomer compounds. Other compounds produced with the roll milling machine include Fluon® ETFEs, Fluon® PFAs and other melt-processable polymers, as well as fluoropolymers from external sources.

"We are frequently called on to develop value-added polymer compounds for virtually all fluoropolymers," Lavagna said. "We also establish production processes for manufacturing large scale compounds. The lab serves as a research and development facility for application and new product development."

AGC Chemicals Americas, Inc. is a subsidiary of Asahi Glass Co. Ltd. of Tokyo, a leading provider of flat glass and construction materials, display glass, automotive and industrial materials, chemicals and electronic materials and products. It employs more than 6,200 people worldwide and is a leader in fluorine chemicals. AGC's new laboratory was built to support the increasing demand for high performance fluoroelastomers in the United States.

In addition to fluoroelastomers, AGC is a proven leader in providing compounded fluoropolymers globally.

Paratherm Corporation, located in Conshohocken, Pa., near Philadelphia, manufactures heat transfer fluids that are non-toxic, non-fouling and environmentally safe, and are compatible with most closed-loop thermal oil systems.

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