

### FulFill® High-Filler Technologies

In late 2010, MTI launched its FulFill® platform of high-filler technologies to provide papermakers with additional cost savings. These technologies increase PCC filler rates in paper and reduce costs by replacing high-cost fiber. The FulFill® E-325 technology has been the most widely adopted by the worldwide paper industry. In 2013, MTI signed four commercial agreements with paper companies to bring our total to 15 agreements on four continents.

### New Products in Performance Minerals

The Performance Minerals business unit, which consists of our Processed Minerals operations and our Specialty PCC product line, has also been successful in developing new, value-added products for customers. Processed Minerals mines and processes ground calcium carbonate (GCC) in California, Connecticut and Massachusetts, and the company has a large talc mine and processing plant in Montana. These products are used primarily in the construction and automotive industries. The Specialty PCC product line is directed to such applications as pharmaceuticals, calcium fortification and automotive sealants

In the past year, Performance Minerals launched its VICRON® FRP new calcium carbonate product for reinforcement of plastic for such applications as sheet molding compound, bulk molding compound and thermoset polyesters. The product reduces the viscosity of thermoset compounds to improve the productivity and quality by providing a better mold-cavity fill at a faster rate. Reinforcement with VICRON® FRP calcium carbonate provides excellent mechanical properties of the finished thermoset part, and is a cost-effective solution for reinforced plastic applications without sacrificing performance properties.

Performance Minerals has also been successful in the commercialization of its Optibloc® talc blends used in high-clarity film and bag applications. Optibloc® talc is an antiblocking agent used to prevent the adhesion of two adjacent layers of film, a problem most associated with polyethylene and polypropylene films. They are designed for high-clarity polyethylene film applications such as food packaging and clear bags.

The business unit is also in the process of developing a new process in manufacturing talc that provides customers with ease of handling and higher throughputs.

### New Products for Minteq International

During the year, Minteq developed a new high performance gunnable refractory material for the Electric Arc Furnace market that was successfully trialed at key accounts in North America. This new technology platform will be further developed and commercialized in 2014.

Minteq also successfully trialed a new calcium delivery system in North America that will be rolled out globally in 2014. This new delivery system has a smaller footprint and is easier to operate.

### High Filler Portfolio

	Filler Points	% Filler Increase (*)	Papermaker Savings (\$/ton)
fulfill series combinations & NPPD Pipeline	15+	75+	Up to 40+
fulfill F series & fulfill series synergies	10+	50+	Up to 30
fulfill E series & fulfill V series	4-9	20-45	Up to 25
fulfill E series	3-5	15-25	Up to 20
fulfill A series	1-2	5-10	Up to 10

\* Assumes baseline UCWF paper at 20% filler loading

### FulFill® E and V Series Deployment

35 Active Engagements Q4 2013

