



*TECHNICAL ARTICLE SERIES*

GG-0804

## **Abrasive Resin Compounder Prevents Blow Outs and Streamers with Pneumatic Deflection Elbows**



HAMMERTEK CORPORATION

USA:  
2400 Emrick Boulevard, Bethlehem, PA 18020-8006  
1 800 505 9665 1 610 814 2273 Fax: 1 610 814 0600  
sales@hammertek.com hammertek.com

# Abrasive Resin Compounder Prevents Blow Outs and Streamers with Pneumatic Deflection Elbows

WHITMORE LAKE, MI — Moving glass-fiber-reinforced resin pellets through dilute-phase pneumatic conveying lines is challenging, owing to the abrasiveness of the reinforced polymer. Plant engineers must not only design conveying systems that minimize pellet damage, which affects product quality, but reduce damage to the lines themselves. Assuring line integrity is especially critical at bends, where material impacts elbow walls when changing direction, often causing blowouts and related downtime.

RheTech Inc., a supplier of proprietary thermoplastic polyolefin alloys and compounds, found a way to preempt such damage.

## Sweep elbows failed monthly

RheTech's production at Whitmore Lake and its companion plant in Fowlerville, MI, run 24 hours per day, five days per week. The company's pneumatic lines, which transport pellets from extruders to storage silos to trucks, were previously blowing out conventional stainless steel long-sweep elbows at a rate of once a month per elbow.

Steve Mosher, maintenance manager at the company's Whitmore Lake, MI, plant, says polypropylene pellets with glass reinforcement impacted sweep elbows at high speed, wearing through elbow walls as if they were sand blasted. The impact also created dust and frictional heat that caused pellets to melt as they skidded along hot elbow walls, forming streamers.

It took one hour to replace each elbow, at a cost of \$120 to \$150 per elbow and \$27 per hour for labor — plus interruption of production, he adds.

To address these issues, RheTech began specifying 90° deflection elbows, which prevent the pellets from impacting the elbow wall, and has since installed 140 of them at both plants, preventing blowouts and associated costs of parts, labor, downtime and pellet degradation.

## Vortex chamber prevents impact, deflects flow

Manufactured by HammerTek Corp., Bethlehem, PA, the Smart Elbow® design selected features a spherical vortex chamber protruding from the elbow. When material transitions into the elbow, part of the flow is automatically diverted into the vortex chamber, where it forms a loosely packed mass that rotates slowly in the direction of flow, gently deflecting incoming pellets around the bend.

The phenomenon prevents abrasion, degradation, frictional heat and streamers, while causing pellets to exit evenly across the elbow outflow in a laminar state, maintaining the dilute-phase distribution of particles required to maximize conveying efficiency.

## Elbow replacements reduced by over 99 percent

The company installed approximately 100 deflection elbows on 4.5 in. (11.4



*Smart® Elbow 90° deflection elbows prevent abrasive glass-fiber reinforced pellets from damaging pellets as well as blowouts at pneumatic line bends.*



*Rhe Tech has only replaced six elbows since installing the original 140 units years ago.*

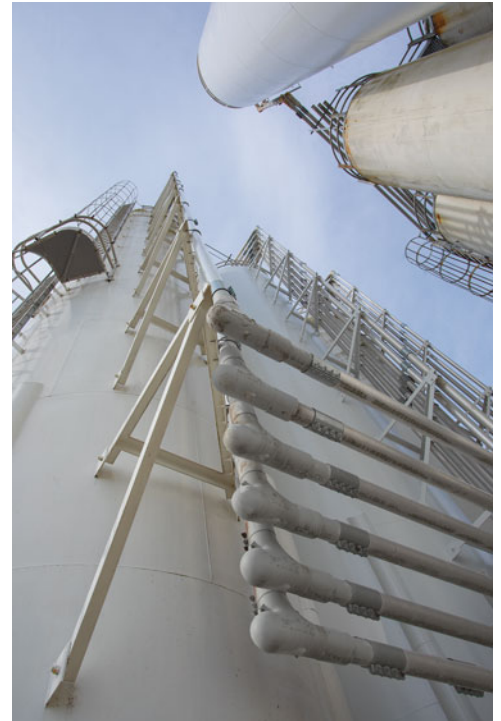
cm) diameter pneumatic lines from the extruders to 70 silos and truck stations at the Whitmore Lake plant, and 40 elbows on 5 in. (12.7 cm) diameter lines running to 30 silos and truck stations in Fowlerville.

"We've replaced only six elbows since installing the original units years ago," Mosher says. "We are more likely to replace the straight sections of pneumatic lines than we are the HammerTek elbows. Blowouts and replacements haven't been an issue for years."

He adds that the elbows, along with adjustments to flow, pressure, and heat throughout the conveying system, have also eliminated streamers.

**RheTech**

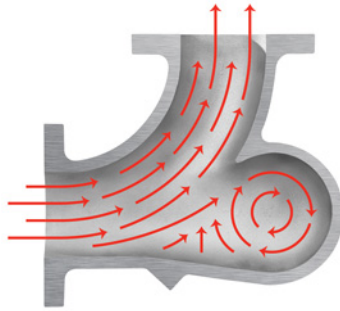
1500 E. North Territorial Rd.  
Whitmore Lake, MI 48189  
1-800-869-1230  
734-769-0585  
www.rhetech.com



*Pneumatic lines transport glass-fiber reinforced pellets to 100 silos and truck stations. Conventional stainless steel long-sweep elbows had been blowing out once a month per elbow and were damaging pellets.*



*Rhe Tech installed 140 90° deflection Smart® Elbows, preventing blowouts and associated costs of parts, labor, downtime and pellet degradation.*



*The elbow' s short radius, vortex design features a protruding spherical chamber that causes a ball of material suspended in air to rotate, gently deflecting incoming material around the bend without impacting the elbow wall or generating heat.*