



TECHNICAL ARTICLE SERIES

HT-1003

Deflection Elbow Conveys Abrasive Product with Virtually No Wear



HAMMERTEK®

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Smart Elbow® Deflection Elbow Conveys Abrasive Product with Virtually No Wear

RheTech, Inc. of Whitmore Lake, Michigan, a designer, manufacturer and marketer of proprietary thermoplastic polyolefin alloys and compounds uses such additives as minerals, fiber reinforcements and other additives in their alloys and compounds that are sold to the transportation and consumer durable goods markets.

The 24-hour-a-day operation now occupies two locations. The second plant in Fowlerville, Michigan, went on line in July 1998. RheTech, Inc. expansions are driven by the marketplaces served, according to the Director of Plant Engineering, Gary Wright. To provide optimal service to customers, downtime must be avoided at all costs.

Polyolefin resins — such as polyethylene and polypropylene — are received via bulk truck and rail car. A twin vacuum-pressure system, capable of emptying two cars at the same time, blows the raw materials over to a switching station from which they are unloaded into storage silos. Next, the materials are conveyed to computerized feeders, mixed with additives, fed into hoppers where minerals are added, then on through the extruders and finally re-pelletized. Finished product is either boxed or stored in silos.

Additives and minerals can make the plastic pellets highly abrasive. Fiberglass is the worst, Gary says.

On the finished-material side of the process, sweep elbows were wearing through every three or four months. First they tried patching over the holes with everything from ceramic tiles to duct tape. Eventually they had to shut down and replace them with new sweeps. RheTech also tried plugged-tee elbows with welded caps — they lasted a bit longer than the sweeps, but they caused damage to the exit pipes.

After years of patching and replacing sweep elbows, Gary got his chance in June 1997 to replace the sweeps with HammerTek Smart Elbow® deflection elbows. In all, 120 tube-size 90° Smart Elbow models were installed, 70 of regular ductile iron and 50 made from hard ductile iron.

"We're as happy as can be," Gary reports. "We haven't had any spills. We haven't had any problems at all." After about a year, RheTech pulled one of the Smart Elbow units from its most severe application for the sole purpose of checking for signs of wear. "A few days shy of one year in service, and we could still see the casting marks. By now, we would have been through four to five sweep elbows and 12 rolls of duct tape. We're impressed," Gary says.

Following the initial quantity installed in June 1997, 50 more elbows were installed four months later, equipping the Whitmore Lake plant with 170 HammerTek Smart Elbow units in total.

The new plant at Fowlerville will never wrestle with blown out sweeps — the Smart Elbow deflection elbow was specified from the start and the plant opened with 65 in place. Gary says the Smart Elbow products initially cost more than the long-radius sweep elbow; however, in RheTech's pneumatic conveying system, the HammerTek elbows pay for themselves in less than one year. Also, as an added bonus, Smart Elbow models create savings by reducing downtime and spilled product.



RheTech found that HammerTek Smart Elbow® deflection elbows could convey highly abrasive finished product with few signs of wear after a year in service. The sweeps previously used lasted only three or four months.



Using long-radius sweep elbows to convey finished product made with abrasives such as fiberglass meant wear-through, spilled product, and downtime to patch and replace.



Smart Elbow deflection elbows are now used on the finished product side of RheTech's operation.

Available Alloys

Aluminum	Socket Weld & Flanged	ASTM SC-64-C	
Carbon Steel	Socket Weld & Flanged	ASTM A216	Grade WCB
Cast Iron	Flanged Only	ASTM A48-94	Grade 30B
Ductile Iron	Socket Weld Only	ASTM A-536-84	Grade 80-60-03
Hard Ductile Iron	Socket Weld Only	ASTM A-536-84	Grade 100-70-03
HammerLast Series 300™	Flanged Only	ASTM A48-74	Grade 50B
HammerLast Series 400™	Flanged Only	ASTM A48-74	Grade 60B
HammerLoy™	Flanged Only	ASTM A-897-90	Grade 230-085-00
Stainless Steel 304	Socket Weld & Flanged	ASTM A351	Grade CF8M
Stainless Steel 316	Socket Weld & Flanged	ASTM A743-84	Grade CF8

Note: Flanges to ANSI specifications. 125# flat-faced flanges on pipe size schedule 10 & 40, and tube-size elbows. 150# and 300# raised-face flanges on pipe size schedule 80.

Other alloys available by request.