

Solvay Advanced Polymers, L.L.C. Augusta, Georgia

Reduced conveyance system blowouts - significantly decreasing labor, parts and lost-product costs

Severe Wear Problems

When Solvay Advanced Polymers began plastics compounding operations in its Augusta, Georgia facility ten years ago, they faced unexpected conveyance line failures caused by severe abrasion and erosion. The plant experienced multiple elbow and pipeline blowouts throughout their dilute phase pneumatic conveyance system less than two weeks after their first compounding line began.

The facility extrudes, pelletizes and packages polymers for advanced industrial applications. The most abrasive products that the plant produces are AMODEL polyphthalamide pellets, which are composed of up to 50% glass. The high-velocity pellets are conveyed through hundreds of feet of equipment, wearing through line piping and causing severe pipe and elbow blowouts. The abrasive pellets travel up to 5,000 fpm through piping straight sections and around elbows, which are particularly susceptible to blowouts.



Elbow and pipeline blowouts were common before Solvay installed Conforma Clad® conveyance components.

Undetected blowouts plagued the conveyance system, costing the plant more than \$200,000 annually in lost product, with each hour of undetected blowout costing \$4,000. The plant spent an additional \$60,000 a year on labor to repair the daily equipment blowouts. Eventually, the blowouts began to create significant yield reductions, affect process distributions and cause safety and housekeeping issues.

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**- Ken Bowles,
Compounding Equipment
Asset Coordinator,
Solvay Advanced Polymers**

Alternative Methods Tested

Shortly after the plant began experiencing piping blowouts, Ken Bowles, compounding equipment asset coordinator at Solvay, began searching for a permanent solution. Bowles tested numerous fixes, with unsatisfactory results.

Standard Type 304/316 short radius stainless steel pipes had a service life from 7 to 21 days in low pressure (4 psi) conveying service. The plant experimented with long radius bend elbows, pocket back deflection elbows, ceramic lined elbows, glass and glass-lined elbows and chrome coatings with tungsten carbide flame spray. They also considered altering the system to accommodate a dense phase product pneumatic conveying system or spiral conveyors with vibratory feeders.

Each method produced unacceptable outcomes, including excessive pellet degradation and undetectable product contamination. Some approaches used elbows that required removal and cleaning between product and color changes. These methods were unfeasible because of the large number of elbows installed throughout the system.



Cyclone clad with Conforma Clad® infiltration brazed tungsten carbide wear protection.

Wear Solutions for the Long Run

The Conforma Clad Solution

The Solvay plant had used Conforma Clad's popular WPR-29 cladding to prevent severe wear on their extruder barrels for several years. Bowles contacted Conforma Clad, hoping they could offer an equally successful solution to his conveyance system wear problems. In 1995, Bowles installed his first Conforma Clad® conveyance components — short radius 45° and 90° elbows — on his dilute phase 4", 6" and 8" conveyance lines.

The elbows performed well, and Bowles quickly realized that he had found a permanent wear solution. He gradually began cladding additional conveyance system components.

First, Bowles installed clad pneumatic conveying lines, which experienced the most aggressive wear. Then, he moved on to attacking less aggressive wear issues. The original Conforma Clad® elbows lasted from 2 to 3 years, and some are still in operation, after nine years of service.

In 1997, Bowles installed 30" downstream clad pipe sections after elbows and turns. He installed clad diverter valves in 2001. Next, he installed clad extruder transition chutes and pelletizer strand guides. Clad cyclones were installed in 2002. In 2003, he added clad pipe sections to the gravity systems and began rotating straight sections 90° to increase wear life. Today, he continues to install additional clad parts and keeps spare field repair components on hand. According to Bowles, "Conforma Clad was the only walk-away-from solution." He now specifies Conforma Clad® cladding on all new equipment.



Solvay paints Conforma Clad® components yellow to distinguish them from unprotected piping.

Bowles is particularly pleased with the active role that Conforma Clad engineers take in his projects. "We've faced a few challenges over the past nine years", says Bowles, "but Conforma Clad took joint ownership of the projects and we worked together to solve them. They want to understand our wear problems and are accountable. This has made all of the difference."

Bowles admits that at first, it was a challenge to convince top management to invest in the cladding. He collected data demonstrating labor, parts and lost product savings resulting from the significant reduction in blowouts. The company quickly realized that the up-front



Mike Clark and Stan Branham spent most of their time weld repairing pipeline blowouts before Conforma Clad.

cladding expenditures would eventually reduce expenses. Now, Bowles specifies Conforma Clad® cladding as a standard on all new projects. The plant recoups the cladding expense in four to five months through yield improvements and reductions in product loss.

Solvay's Mike Clark and Stan Branham used to spend their time making daily weld repairs on elbow and piping blowouts throughout the plant. Today,

they concentrate on proactive projects instead of reacting to unexpected blowouts. Branham says, "Every time an unprotected pipe blows, we replace it with one from Conforma Clad. We paint all of the Conforma Clad® parts yellow. One day, we'd like to paint the whole line yellow."

Conforma Clad Technology

Conforma Clad is a leading provider of severe wear solutions for industrial applications involving extreme abrasion, corrosion and erosion. Conforma Clad® components are

effective in high wear environments where equipment failures are persistent problems.

Our proprietary infiltration brazed tungsten carbide cladding is metallurgically bonded to component surfaces. Conforma Clad's cloth delivery system enables densely packed tungsten carbide to be uniformly applied to complex geometries, providing a protective layer that wears at a uniform and predictable rate. The result is a durable cladding that is extremely abrasion and corrosion resistant.

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