



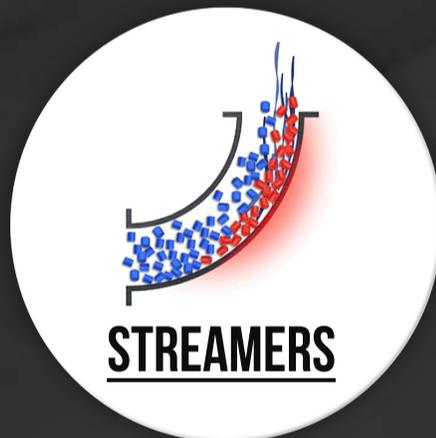
PROCESS SOLUTIONS & MATERIAL HANDLING
Your Plant-Wide Custom Engineered Process Solutions Provider

SMART ELBOW®

Guaranteed Reduction in Elbow Wear for Pneumatic Conveying Systems with the HammerTek® Elbow



HAMMERTEK®



PREVENT





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The HammerTek Smart Elbow® provides long-wearing protection from elbow failure in pneumatic and hydraulic conveying systems.

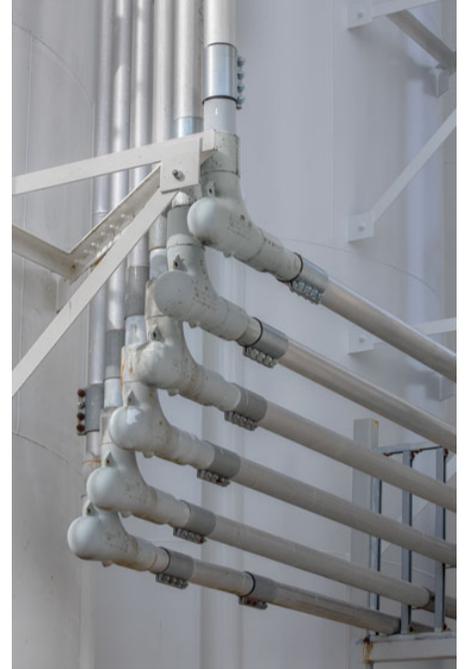
Power generation

Hammertek® Elbow Piping protects against wear and leakage in pneumatic conveying applications better than any other elbow type. These patented steel elbows boast tremendous wear-resistant properties that significantly reduce material and labor costs, as well as costs relating to compliance with any EPA cleanup/material disposal regulations.

The Hammertek® Elbow can also prevent excessive emissions penalties at combustion-based power generation plants. It safeguards emissions control systems which contain pneumatic conveying components because it removes the threat of elbow wear and subsequent system failure.

CASE PROBLEM: The sulfur emissions reduction system at a large east coast coal-fired powerplant was experiencing frequent shut-downs due to leaks in regular stainless steel elbows. Their steel elbows were wearing out approximately every four months in the pressure relief/vent lines of the MgO transfer system. When leaks occurred, the system was shut down for repair, jeopardizing the scrubbing system's ability to maintain sulfur dioxide emissions below mandated levels. In addition to downtime, maintenance hours and repair materials, paperwork also had to be filed and cleanup handled in accordance with EPA regulations.

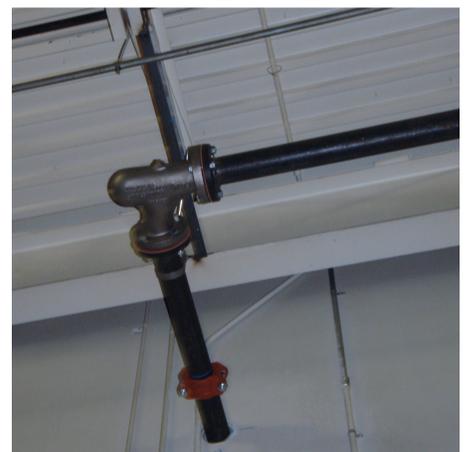
SMART SOLUTION: Six 3-inch carbon steel HammerTek Elbows were installed in the MgO vent/return line, and have continue to operate without a single problem for over ten years.



Environmental

Hammertek® Elbow Piping protects both the workplace and the environment in several ways. First, it protects against leaks by virtue of its unique wear-resistant design. Second, it reduces conveying system noise.

TEST RESULTS: In a study conducted by a major plastics manufacturer, polypropylene pellets were conveyed in a test pneumatic conveying system using a 2-inch line. The Hammertek® Elbow was substantially quieter than a comparable long radius sweep elbow at the same velocity, loading and conveying rate. The significant decibel reduction was attributed to the Hammertek® Elbow Smart Design, which effects the change in material flow direction by deflection of particles through the elbow, not by impact with the elbow walls.



CASE PROBLEM: At a fructose manufacturing plant, a purifying carbon slurry was wearing through long radius sweep elbows every one to three months. Elbow patching and replacement, added to production downtime, material loss, and cleanup made the wear problem expensive. When the leaks occurred, product was lost, and the spilled carbon granules damaged the filter tank insulation which had to be disposed of in an environmentally acceptable fashion and replaced with new materials.

SMART SOLUTION: The sweeps were replaced with Hammertek® Elbow. Not one has required replacement since their installation.

CASE PROBLEM: At a trash-to-energy facility with three incinerator units, stainless steel sweeps were wearing out every three months in a dense phase pneumatic conveying line - a component in the lime injection system which reduces sulfur emissions. If the failure lasted more than a few hours, the EPA mandated total incinerator unit shutdown, which would have resulted in downtime expenses of \$40,000 per day.

SMART SOLUTION: The Hammertek® Elbow was installed and is still in operation, with new units being installed in a new higher capacity lime-injection system.



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Water/Wastewater Treatment

The Hammertek® Elbow is the world's only patented flow-controlled elbow pipe fitting. Its unique design reduces water hammer and provides smoother, surge-free flow in hydraulic lines. The improved flow characteristics of the Hammertek® Elbow has enabled abrasive slurries to be conveyed without elbow wear and leakage.

CASE PROBLEM: A Mideastern U.S. wastewater treatment facility was having problems conveying fly ash slurry to the settling pond. Fly ash is the remaining dust and fine particles from the furnace after the fuel has been burned. The fly ash is mixed with water and conveyed (approximately 15% solids) to the settling pond where it is then gathered in a more solid state for removal. The conveying system was using long radius elbows which, dependent upon the production, were subject to erosion from the fly ash and the velocity of the slurry. Monetarily and environmentally, the sewage treatment plant could not afford unscheduled shutdowns for repair/replacement.

SMART SOLUTION: The Hammertek® Elbow was the choice to replace two long radius elbows. The customer was so satisfied with the results that an additional two elbows were replaced with Smart Elbows®. They are now considering replacing a majority of the system's elbows at their next scheduled maintenance shutdown. They have also passed the information of their experience with Hammertek® Elbow onto their engineering group to solve similar problems at other plants.

Processing Industries

The Hammertek® Elbow offers an intelligent solution to a wide range of common conveying problems. Processing industries report huge savings in labor and maintenance costs.

GRAIN/ BREWING: A Southwestern U.S. brewery needed to upgrade a pneumatic grain conveying system linking rail car delivery and 95' high storage silos. A faulty diverter house at the top of the silos was being replaced by twelve 6-inch lines, with elbows at top and bottom. Based on calculations designed to achieve both minimal grain hull damage and system pressure drop, specifications called for 4' radius sweep elbows, which would never fit the severely limited space.

SMART SOLUTION: Twenty-four Smart Elbows were installed. They fit the desk-sized area and also protected the grain hulls from impact damage. The project came in \$30,000

PLASTICS: Friction due to contact with elbow walls created heat which would then melt and smear the polypropylene pellets being conveyed by a plastic manufacturer in the southern U.S., creating streamers, and eventually wearing through the elbow walls.

SMART SOLUTION: When the sweep elbows were replaced with 10-inch aluminum Smart Elbows®, streamer formation and wear-through were eliminated.

PHARMACEUTICALS: A major Northeastern pharmaceutical manufacturer experienced repeated plugging and nonstop product degradation in lines used to convey granulated magnesium hydroxide. Investigation revealed the long radius sweep elbows produced an uneven flow which caused the plugging and impact with the elbow walls caused the product degradation.

SMART SOLUTION: Installing Smart Elbows® provided the laminar, smoother flow desired and actually improved product integrity. The company estimated \$50,000 savings in product loss alone.

PULP & PAPER: The Canadian pulp and paper industry encountered problems when hog fuel (a by-product composed of bark and sawdust) is pneumatically conveyed. Its abrasive nature wore through one particular 12-inch wear-back sweep elbow every three months.

SMART SOLUTION: A 12-inch Smart Elbow® was installed in 1990 and continues to perform well. Since then, all the system elbows were replaced with HammerTek elbows.

