

Flatback elbow work

Every twist and turn in the ducting of an internal alternative fuel transport system will cause a directional change in the process stream and the possible development of a high wear application and/or clogging point. However, particularly when processing extremely abrasive materials, flatback elbow pipes with replaceable wear components can extend service life beyond that of conventional pipe elbows.

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The technology and engineering in today's cement plant fuel systems is constantly evolving. Lower fuel costs and the related fuel credits for the use of alternative fuels (AFs) is a growing area of profit for the industry. The continuing development of AF energy systems is helping solve the environmental challenges presented by both the hazardous and non-hazardous waste being generated by our economies. Systems have to be capable of processing everything from auto-fluff and old carpeting to wood by-products and even medical waste.

Elbow work

AF system designers try to alleviate the high wear problems present in multifuel systems before they get off the drawing board.

Internal raw material transport systems are typically pneumatically driven. Every twist and turn in the ducting will cause a directional change in the process stream and the possible development of a high wear application and/or clogging point. These high wear and sticking points, if identifiable during design, are usually addressed by using some form of hardened, conventional pipe elbow. In most cases this solution works and is cost effective. Either the process material is forgiving, or system speeds are managed in such a way that these potential issues are mitigated.

In other cases, the process and the material fight the designer's best efforts and a custom approach to the application is required. Unfortunately, not all the system's twists and turns are addressable with standard long or short radius 45° or 90° elbows and require customisation.

Specialty fabrications and their custom designs carry a significant increase in cost over the use of a standard hardened elbow. Custom fabrications using hardened



Flatback elbows undergoing final inspection before shipping

materials become one of the alternatives. If a hardened fabricated conventional pipe elbow solves the issue, the increased cost is somewhat minimal.

In systems processing extremely-abrasive materials the conventional round pipe elbow configurations present the same old issue that has challenged industry since pneumatics began being used as propulsion. Specifically, the channelling of the material to the back wall of the elbow, causing premature failure. The holes that develop and the patching used as a temporary remedy can also interrupt the flow, causing the material to build up and eventually plug. These failures will cause the fuel feed system to be shut down for repair and is costly.

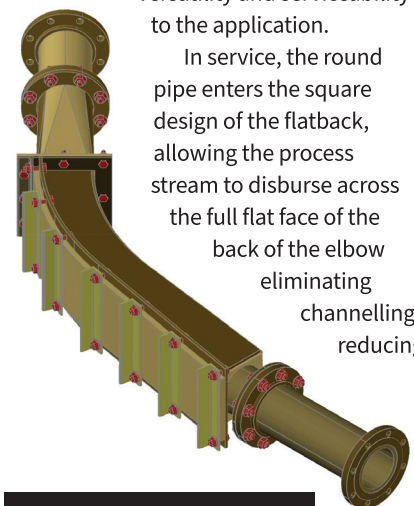
Flatback design

The AJ Weller Corp specialises in solving the high wear challenges found in multiple heavy industries by using advanced wear technology, 40 years of experience, and the

ability to recognise and share the synergies that have developed by working in all types of bulk processing industries.

One of the solutions that has proven to be effective is a flatback elbow design. AJ Weller's design incorporates replaceable wear components, lending versatility and serviceability to the application.

In service, the round pipe enters the square design of the flatback, allowing the process stream to disburse across the full flat face of the back of the elbow eliminating channelling, reducing



Flatback elbow 3D rendering

wear and lowering the chance of plugging substantially. Once the turn is made, the process material stream is transitioned back to a conventional pipe diameter. The flatback elbow consists of three major components, the pipe entrance and inner and side walls, the flatback portion of the elbow and the square to round transition. Additional tangents to the assembly may be needed and are designed and supplied on a case-by-case basis.

The cost of the flatback elbow



Mini-flatback elbow

fabrication will exceed that of an “off-the-shelf” elbow, and requires the production and maintenance team to consider a variety of costs incurred by the continued use of the conventional elbow. These include everything from the downtime costs of failures, the repair or replacement costs of the existing elbow, lost production costs, safety issues and the cost of scaffolding or the supporting equipment required to access the elbow, to name a few. Overall cost effectiveness is determined by the answers to these types of questions and should be weighed carefully before decisions are made.

Versatility and integrity

The versatility of a flatback design allows The AJ Weller Corp to match the component’s wear material to the demands of the customer’s application. The application may require a combination of two or more types of wear-resistant material. High temperatures, high moisture and material speeds are all considered in any recommendation the company would



offer. The flatbacks themselves lend good structural integrity to the system. They can be fabricated to fit almost any centre line radius and can be designed to suit applications with diameters ranging ~10-304cm (4-120in) or more. The replaceable wear-backs are flanged, banded or both to allow for easy replacement and repair.

Extended service life

Upgrading to a flatback elbow in the right application can substantially reduce costs and extend service life far beyond that of a conventional elbow. ■

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Product Spotlight: WellerCLAD®

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