

Protection for coal handling

by AJ Weller, USA

The AJ Weller Corporation, a 26 year-old company out of Shreveport, Louisiana, known for its wear technology leadership, has met the challenge the cement industry is facing. By maintaining a very proactive involvement in new technology and a continual improvement of existing products and techniques, AJ Weller has been able to continuously provide solutions to the issues of wear of process equipment due to impact and abrasion as well as material flow enhancement using their proprietary composite technology.

One of AJ Weller's multiple product lines that in recent years, has experienced an exciting and innovative development is in the WellerCLAD® family. Products such as WellerClad Premium Chrome Carbide Overlay, WellerCLAD HYROC®, WellerCLAD TECH 9® and WellerCLAD HYPOL® have all been successful in solving different wear and sticking issues within the cement industry.

In a plant in the USA, the maintenance manager, having heard of some of the successes of WellerCLAD HYPOL in solving situations where there was impact, abrasion and sticking problems all at the same time, invited the AJ Weller team to work with him and his team to solve the ongoing problems they were having with their dual screw conveyor coal feeder system to the coal mill. The principal issue affecting the OEM part was wear to the housing of the screw conveyors causing leakages, often within the first 12 months. In an attempt to try to extend the life of housing, the maintenance manager had taken to "beefing up" the known wear areas of the coal feeder on the new OEM part prior to its installation but would still need go back to patch and rework some of the wear areas in

As cement plants throughout the world are experiencing longer production cycles and higher demand for their finished product, the need to extend the life of the process equipment becomes more critical. Where in times before scheduled shutdowns tended to be on a regular annual basis, the increase in the demand of cement has often obligated cement companies to extend the time between campaigns so as to be able to comply with their customer's wishes. This in turn has resulted in greater wear and tear of the equipment throughout the production process.



Figure 1: AJ Weller solves a wear protection problem with a dual screw conveyor

hopes of extending the life of the part for two 12-month campaigns. In addition to the abrasive wear, this cement company would occasionally experience sticking of the coal fines due to moisture in the coal that would build up and jam the screw conveyors tripping the automatic

shutdown of the conveyor drives and requiring the maintenance crew to open up the system and clean it out. Coupled to this, non-ferrous tramp material (usually tree roots) would sometimes drop into the conveyor system causing bending and twisting of the flights of the



Figure 2: the dual screw conveyors were treated with Grade 185 WellerCLAD® premium chrome carbide

Figure 3: WellerCLAD HYPOL[®] was utilised on the conveyor housing to protect against impact and abrasion

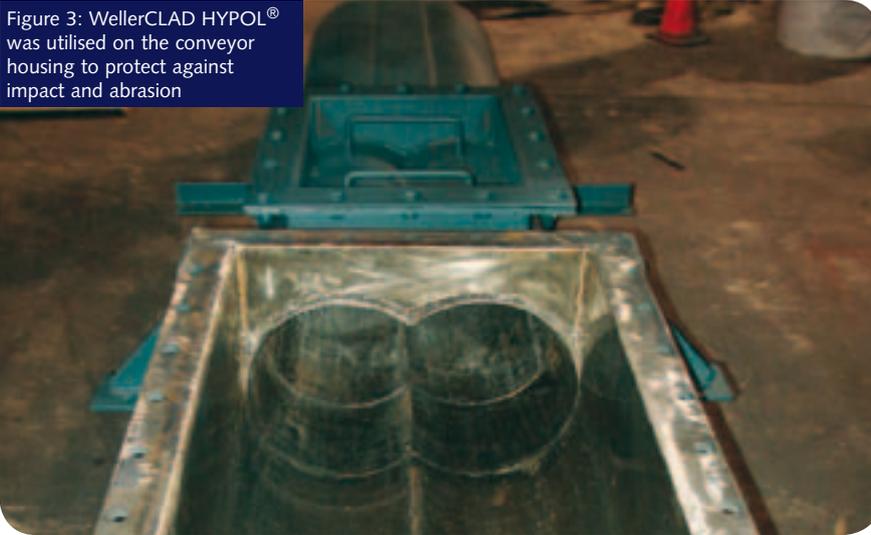


Figure 4: view through the dual-screw conveyor housing



Figure 5: side view of the conveyor unit



screws before the system shut itself down. This required the maintenance team to always have additional screw conveyors in stock so as to be able to switch out the damaged ones whenever this occurred. Although the maintenance manager had considered having the housing fabricated with chrome carbide overlay to retard the wear issue, he was reluctant as he thought that any bucking or bowing of the screw conveyor itself could 'hit' the ridges of the overlay, due to the tight tolerances between the housing and the conveyors, causing damage to the flights. Also it was argued that the 'valleys' between the ridges could be an area where the fines could stick causing a build-up and eventual plugging of the whole system.

AJ Weller was asked to find a solution and fabricate the dual screw conveyor coal feeder in a way that would address all the above issues and extend the life of the parts past 24 months. After constructing the framework out of carbon steel, AJ Weller then proceeded to fabricate the screw conveyor housing by rolling to a very tight radius WellerCLAD HYPOL as well as lining the insides of the inspection doors with WellerCLAD HYPOL. Finally the screw conveyors themselves were fabricated with 0.25in on 0.25in, Grade 185 WellerCLAD premium chrome carbide

overlay on the flights. All was assembled and tested at the plant prior to shipping to the customer.

WellerCLAD HYPOL is an exciting new product from Weller that has been engineered to handle impact and high

abrasion while promoting continuous flow. Developing a quality product that can tackle all three of these issues and provide for a useful service life can be extremely challenging, but Weller[®] has solved this dilemma through a proprietary state-of-the-art metallurgical process.

The unique chemistry and manufacturing process lend themselves to excellent lubricity, which will promote flow. The carbide size, density and consistency provide a super tough wear surface that stands up well to high abrasion. The state-of-the-art fusion process makes the material tough enough to absorb heavy impact without degrading or spalling.

After 18 months of continuous use The AJ Weller dual screw conveyor coal feeder shows no significant wear of the WellerCLAD HYPOL housing. There has not been any incidence of coal fines sticking or building up in the housing. Lastly, on the occasions when tramp material has fallen into the system (again tree roots), and jammed the conveyors, the automatic tripping system that shuts down the drive has worked as it was designed to do without any damage whatsoever to the flights of the screws due to the toughness of 185 Grade WellerCLAD premium chrome carbide overlay. █

Figure 6: sticking and wear has now been eliminated



Figure 7: WellerCLAD HYPOL[®] is a new product from AJ Weller

