Cure for the Baghouse Blues

Ammonia. Who would have known that the introduction of ammonia would have such troubling effects on baghouses at cement plants?

Take, as an example, an established cement plant in the southwestern part of the United States. Its baghouses were thirty years old and had experienced very little to no wear, and they had never experienced any rusting at all. However, due to NOx levels in the system, the EPA and the company's environmental department made them introduce ammonia into the system for the purpose of reducing the levels. That worked. Unfortunately, the side effects were devastating. Because of the ammonia and condensation from varying humidity levels, a very aggressive and corrosive reaction began. The PH levels began to fluctuate between eight and nine. Actual flakes of rust from the corroding baghouses were blown out of the stack and were seen all over the parking lot and on vehicles. Upon further inspection of the baghouses, it was found that holes had begun to develop and were leaking as well. The cement company's environmental department saw this as an environmental hazard. The leakage in the baghouse needed to be sealed up and stop the rusting as well.

What was needed to accomplish this was a solid, monolithic coverage that was impervious to moisture. All traditional lining methods required sand blasting and a thin layer sprayed directly to the metal. Several traditional lining methods—Stack Guard, Flue Guard, and Ceramic Mastic were a few—had been considered and used to no lasting avail. In fact, the coatings that had been used began to peel off in six months. These short-term "solutions" came at a cost. One of the bids to do the whole job was $1.2 million.

Harrison Rhodes, Wear Specialist with Wear-Concepts, was meeting with the Maintenance Manager on a separate issue when the subject of the baghouse came up. Harrison suggested Densit WearSpray 500. The Maintenance Manager, (being familiar with Densit) responded, "I only knew Densit as a heavy-wear product," and he continued by saying, "No way we were putting Densit in that Baghouse. It is way too much weight." Harrison explained that the makeup of Densit's density does not allow moisture to penetrate. It is used for offshore platform rigs and offshore windfarm bases because of its ability to withstand saltwater attack. Not only would it seal the leaks, but it is also heat resistant to 750° F. No sand blasting required. Because of the weight, Harrison suggested a thin stainless steel stucco style mesh to anchor the Densit. This would allow Densit to go on at a ½" thickness, cutting the weight in half. Since wear was not an issue, Densit WearSpray 500 was offered, which was also cost effective—about ½ the cost of Densit 2000.

On January 7, 2019, Wear-Con's Field Service crew started the baghouse repair. Grinding began to expose good metal to weld the new mesh to. Densit WearSpray 500 was then installed covering 9000 sq. ft. of baghouse walls at ½" thick. The cost of the job was 1/3 the cost of the other materials that had been used.

"It has been in service 3-1/2 years now and still looks like it was just installed. The baghouse has no leaking at all; and from what we can tell, the rusting has either stopped or has been greatly reduced. We have less downtime and fewer manhours lost on repairs. Prior to installing Densit, we were shutting down for three to four hours three times a month to make repairs on the baghouse. When we shut down, it costs us $28,000 per hour, which is approximately $4M in lost production per year. We have not had to do this for three years now other than scheduled PMs. Also, with the rate of degradation, we were looking at possibly having to replace the entire baghouse with a new one at a cost of $38 million within the next two to three years. If I must put a number on it, I would have to say we have saved approximately $50 million so far," said the Maintenance Manager.

One of the benefits they have seen is their particulate levels have been greatly reduced. Emission levels before the installation were at 1.5 pmm but after Densit was installed, they went down to .3 to .11 pmm. That is a huge decrease! The opacity levels are the measure of the amount of dust getting through the system. Before Densit was installed, they had a reading of 10. Now it's consistently at 1.56. Harrison suggested the drop was possibly due to the texture of the Densit, helping trap the particulate matter.

Due to experiencing such success, the Maintenance Manager has added: "We intend to do both of our stacks, the ductwork, our other baghouse, and our downcomer ducts."

Wear-Concepts with Densit offers corrosion and abrasion–resistant lining systems for bulk material handling. Corrosion-resistant lining systems, with operating temperatures up to 750° F, have been installed to baghouse filtration systems which include duct work, boilers, and flue gas ducting and chimney stacks. Abrasion-resistant lining systems, with operating temperatures of up to 2190° F, have also been installed in pipe work, ducting, chutes, mills, classifiers, cyclones etc.

WEAR CONCEPTS
We'll take it from here!

Densit

WearFlex, WearSpray, & WearCast
Chemically Bonded, Corundum-Ceramic, Monolithic, Cementous, Wear Lining

"We'll Take It From Here"

WEAR CONCEPTS

Wear-Con Densit® WearFlex 2000

A trowelable, one-component, ready-mix, cementous, wear compound combined with wear-resistant corundum-ceramic aggregates to provide a tough, long-lasting wear lining. WearFlex 2000™ is applied directly to an anchoring mesh in thicknesses from 3/4" to 2", providing seamless graduation in lining thicknesses on almost any shape without vulnerable joints. Densit® WearFlex installs even overhead and can be used after just 24 hours.

Densit® WearSpray 2000

The same as WearFlex 2000™ in every way except that it is a sprayable, allowing for fast monolithic coverage over large surface areas and system components with complex geometric shapes.

Densit® WearCast 2000

The same as WearFlex 2000™ and WearSpray 2000™ in every way except that it is castable and is able to conform to almost any shape and size specification such as pipes, bends, and other system components.

Install Mesh

Mix

Spray

Trowel

Cast

Cure

Project Management

The priceless combination of leadership and service is rare indeed. That's exactly what Wear-Concepts offers with their experienced Project Management Services: leadership to direct your crew on sight to a whole new level of performance and the service that respectfully owns your wear problem. Our Project Managers will train, steer, and supervise your people to make sure the job gets done right by providing professional oversight of the installation of Densit® WearFlex™ at your location. Wear-Con's Project Managers have years of field crew, command experience; therefore, our Project Management guidance and instruction will insure outstanding results by your crews.

Densit® Options

Wear-Con Densit® solutions are unique and innovative. Therefore, Wear-Con will partner with you to develop custom solutions for your wear issues that are practical and cost effective. There are three basic options available. They are:

1. **Purchase all material and rent the mixer from us.**
2. **Option #1 plus have a Wear-Con Project Manager train and lead your crew.**
3. **Have Wear-Con Field Services do it all.**