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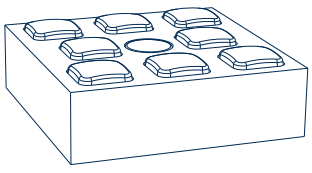
Innovative impact wear panel design lasts more than 10 times longer

“Hindustan Zinc Ltd (HZL) is quite satisfied with the performance of FerroCer impact liner which has 10 times the wear life of manganese steel liners. It has reduced maintenance time due to the much longer replacement cycle, eliminated possible damage to the mother plate and spillage of material due to the highly abrasive nature of ore, and significantly reduced safety hazards. HZL intends to install FerroCer impact wear panels in all the high impact wear locations. “

Mr. Praveen Bhardwaj
Asst. General Manager (Mechanical),
HZL - RA Mines, Rajasthan



When a major mine in India was faced with severe wear issues causing frequent stoppage of their material handling system, our FLS Mining Aftermarket team provided an innovative wear solution, FerroCer®, which addressed the customer’s major pain point in operation. The solution ended up exceeding everyone’s expectations.

Background and objective

Hindustan Zinc Ltd (HZL), a Vedanta group company, is the largest lead and zinc producer in India and one of the largest lead and zinc producers globally. They have four operating lead and zinc mines in the state of Rajasthan, the largest being Rampura Agucha Mine, which has four streams (production lines). HZL processes about 12 million tonne of lead and zinc ore a year and is rapidly ramping up their ore production, processing and metal production.

One of the major challenges faced by HZL was the high wear in the material transfer chutes. The material handling system needed to be frequently shut down so the worn-out wear liners could be replaced with new manganese steel liners. These weighed about 50 kg each and had to be manually handled.

Because of the elevated location of several chutes, replacement of the liners required safety preparations (such as scaffolding and other access and handling arrangements), with five to six workers required for replacement of liners in the chute. The manganese steel liners had a typical lifespan of less than 25 days, which led to the frequent stoppages and potential safety risks during replacement.

Objective: To reduce frequent stoppage of the material transport system and reduce safety hazards.

FerroCer Impact wear liner solution

Defining the project

The mine managers knew that if they wanted to significantly decrease the lost time due to the replacement process of the liners that an innovative product would be required. Their goal was to install wear panels which had much longer wear life. They had heard about FerroCer wear panels developed by Danny Baric, Product Manager for Wear and Thermal at FLS. With an agile modular design, small size and light weight of just 5 kg per panel (or 9 kg per edge panel), they have been a major breakthrough in the market.

Our Mining Aftermarket officials visited Rampura Agucha Mine in June 2017 and recommended FerroCer wear panels to address the high wear issues in the material handling chutes.

Each panel comprises a set of abrasion-resistant ceramic inserts enclosed in a matrix of malleable steel, which ensures only the inserts' top surface is exposed to material impact. The sides of the inserts are tapered within the matrix, keeping them in place and preventing material particles and fluids from damaging the panels.

The solution

FLS installed the FerroCer impact wear panels at the high impact wear zone in U-13 tripper chute (after primary crusher) at the RA Mines Stream-1 on 1 November 2017. Each panel is attached using a single countersunk bolt. An entire chute can be lined with the two types of panels: the standard panel covers most of the chute's surface, and the edge panel is elongated to cover the chute's entry and exit points. The panels can also be trimmed to accommodate irregular shapes or corners.

A complete calendar year after the installation, 40 per cent of the liners had lasted for 345 days before needing replacement while the remaining 60 per cent are still in operation, withstanding approximately 1.8 million (18 lakh) tonnes of lead and zinc ore conveyed through the U-13 tripper chute. That means HZL had absolutely no wear panel-related downtime for almost a year – a very impressive achievement compared to when the 40 mm thick manganese steel liners gave a life of just 23–25 days before needing to be replaced.

The results

The use of FerroCer Impact wear liners by RA Mines HZL has reduced maintenance time due to a much longer replacement cycle. It has also eradicated possible damage to the mother plate, and eliminated material spillage due to the highly abrasive nature of ore. HZL intends to install FerroCer impact wear panels in all of its high impact wear locations.

Weighing only 5 kg, FerroCer Impact wear panels are very safe to handle and install. Because of their long-lasting durability, they are perfect for hard-mineral mines such as nickel, gold and copper. They have proven to be just as durable in mines in Australia and Peru.

Wear measurements were taken periodically and FerroCer outperformed manganese steel liners by more than 10 times. This far exceeded our FLS own guarantee of a lifespan three times greater than the manganese steel liners.

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