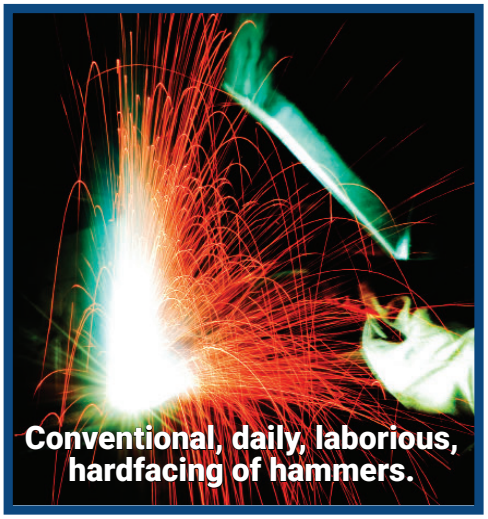
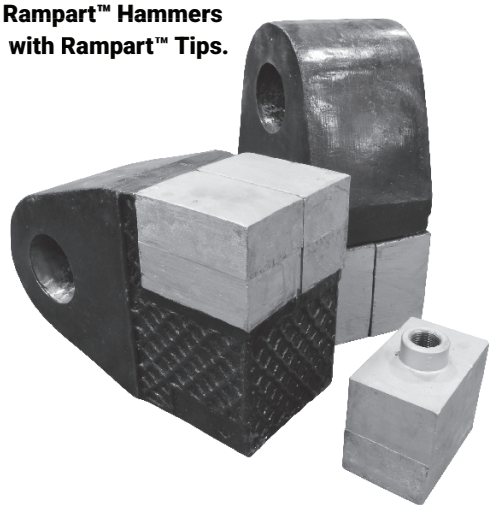
SUCCESS STORY

Hammered Out Solution


Conventional, daily, laborious, hardfacing of hammers.

The challenge – This past year our Wear Specialist Cory Booz was presented with a wear issue to find an innovative solution application for a Midwest cement customer who had issues with their secondary one directional limestone crusher. This case posed a special set of problems that needed to be resolved.

Root issue – During full production, the client would have to rebuild his old hammers every day with hard surface rod to insure proper grind requirements. This would require the plant to shut down the crusher and have two people every night (one in the crusher welding on the hammers and one as a hole watch because it's a confined space) spend up to six hours doing the job. This also led to problems like headaches and carpal tunnel in the welder's wrist due to the repetitive motion of hard surfacing the hammers in the cramped space. This also required hundreds of pounds of hard surface rod. The client, over the past few years, had tried several different hammers from a variety of vendors in an effort to solve the problem of continuous, laborious hammer rebuilding. Nothing worked.


Rampart™ Hammers with Rampart™ Tips.

Enter stage left – Rampart™ Hammers to the rescue! Rampart™ Hammers use a unique Matrix Carbide Technology. Matrix Carbide Technology consists of:

- Complex metallic compounds and carbides that are ground into a very fine powder.
- These metallic powders are then precisely measured and blended thoroughly together in batches according to a formula that has been custom designed for a specific wear need.
- The powdered metallurgy mixture is then poured and compacted into a mold with a mild steel backing.
- Once formed, the powder castings are loaded into a vacuum sealed autoclave and heat treated at a high temperature.

Outcome – A block of Matrix Carbide with its compounds locked into a metallic, crystalline, structure that is completely different from its competitor. As you can see, the old method of conventional hardfacing leaves acicular "strings" of chrome carbide unevenly distributed with random concentrations. (See figure 1 on back) But the Rampart™ Hammers, with its unique Matrix Carbide Technology, produces hexagonal "honeycomb" like crystalline structures that are evenly distributed with consistent

Rampart™ Tips with bolts.

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WEAR CONCEPTS
We'll take it from here!

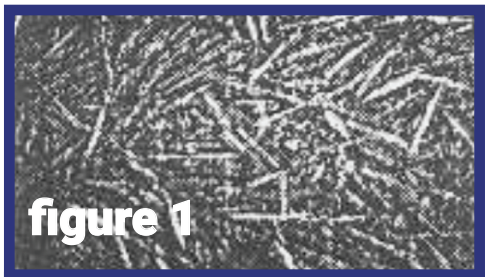
figure 1

figure 2

concentrations. (See figure 2) The resulting product demonstrates a performance of longer lasting, even, and consistent wear.

Solution – A complete set of Rampart™ Hammers with replaceable Rampart™ Tips were installed in the secondary crusher. The first run of these went very well; they ran for two months with no hardfacing and no downtime. Then a decision was made by the plant to use the secondary crusher as a primary crusher while the primary crusher was being overhauled. Unfortunately the magnet to remove metal is ahead of the primary not the secondary. They ended up getting a large piece of metal in the crusher that destroyed many of the Rampart™ Tips. However, at that point they decided that the Rampart™ Hammers did so well, that if they ever had to use the secondary as a primary again, they would simply swap hammers in until they could get back to the normal line-up. Then they would use the Rampart™ Hammers again in the secondary.

Results – Currently the new set of Rampart™ Hammers have been running for over four months and crushed over 90,000 tons of limestone with no problems whatsoever. The Rampart™ Hammers are still running and the plant maintenance team members are very happy with the performance because the hammers have eliminated the need for the old hardfacing procedure which entailed:

- Cost of labor to weld and supervise. (At least $7800 per month.)
- Cost of welding wire. (At least $2500 per month.)
- Cost of health hazards. (Can you put a price tag on the cost of someone's health?)

Bonus – The Rampart™ Tips have additional benefits! Once the removable tip is worn out on one side, it can be unbolted and rotated 180° then put back into production. When the tips are finally shot, they are simply replaced. There is no need for a whole new set of hammers. The replacement Rampart™ Tipscost less than the previous hammers that were in use. Just replacing the tips is also a labor savings by not having to pull and replace the hammer bodies. That's very cost effective and pretty simple compared to trashing the entire set and replacing them with new ones.

Success – In four months the plant has not had to replace the Rampart™ Hammer's Rampart™ Tips and they are still going strong today. They have not been rotated either. The true life span of the Rampart™ Tips in this particular application is still unknown. Conservative estimates seem to indicate that the plant is saving an average of at least $10,300 per month not to mention the health benefits. This has reduced the size of the workforce and the two happier, healthier workers are now able to concentrate on other maintenance issues. That's more than what the cement plant paid for the complete set of Rampart™ Hammers originally! How much savings are we looking at for the year? At least $123,600! The hammers with their tips are currently being monitored and the tips will be weighed and measured upon the completion of their run. That's a Hammered Out Solution!

Results in comparing both sets of hammers.	Manganese Body	Sintered Carbide Tip	No Hardfacing	Reduced Down-Time	Safer Maintenance	Reversible Tip	Replaceable Tip	Easy Replacement	Cost Effective
Manganese Hammer	X								
Rampart™ Hammer	X	X	X	X	X	X	X	X	X

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