

Material Matters...

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SUMMARY

When selecting abrasion resistant irons, it is important to remember that high chromium cast iron castings are performance alloys that are tailored for demanding slurry environments. This basic overview and understanding of the main alloy differences should help ensure they are properly selected and applied in the environments for which they were designed.

Alloys selected for abrasion resistance should offer the highest hardness possible in a martensitic matrix. Tempering after hardening to achieve a tempered martensitic matrix greatly improves toughness and fracture resistance. As noted, abrasion resistance is improved by selecting an alloy with increased carbon and carbide volume, while toughness is improved by strengthening the metal matrix. Greater volumes of carbides are achieved by increasing

both the carbon and chromium level within the base metal.

While abrasion can result in premature wear of slurry pumps on its own, when it is also combined with a corrosive mechanism accelerated erosion-corrosion can be expected. Steps taken to lower the carbon content and increase the chromium will raise matrix chromium levels and improve corrosion resistance. Increasing chromium to the very highest solubility levels achieves a superior corrosion resistant ferritic alloy, which is best for more complex corrosive slurries.

Finally, the synergistic effects of abrasion and corrosion results in much greater wear than those where each mechanism is present alone. Therefore, one of the first considerations when selecting an abrasion resistant alloy for any

application is to determine if a corrosion mechanism will also be present, and to what extent corrosion will effect overall wear if combined with solids abrasion.

It is essential to recognize that conditions in one type of slurry may be completely different from another, requiring a different material selection altogether. When handling complex erosive-corrosive slurries, the best performance often is achieved by nothing more than having the right high chromium alloys matched to the specific service needs. ■

References:

1. MARATRAY, F and USSEGLIO— NANOT, R., "Factors Affecting the Structure of Chromium and Chromium-Molybdenum White Irons," Climax Molybdenum Publication, 1970

Service Solutions

Thai PRO Services Adds Valve Repair Capabilities

Scott Torgusson, A.P., Facility Manager
Thai PRO Services, ITT Industrial Products Group

The Thai PRO Services Center now has both in-house and field valve repair capabilities with the addition of EFCO grinding and lapping equipment.

Repairing valves in place versus valve replacement provides many customer benefits. For example, welded-in valves, such as in most electric power stations, require extensive resources to have them replaced or traditionally repaired at a workshop.

- Insulation removal
- Cutting out the welded valves from the pipeline
- Taking the valves to a workshop for repair
- Joint preparation for re-welding
- Re-welding of the repaired or replacement valve back into the pipeline
- Inspection of the weld joint
- Re-installation of the insulation

With the Thai PRO's new valve repair capabilities, we are now capable to provide in-place repairs to reduce your customer's downtime and associated costs

Capabilities:

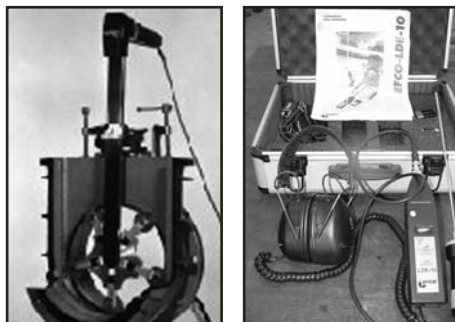
Up to 48" Inches for gate, check and disc valves
Up to 12" Inches for globe and plug valves
Up to 8" Inches for safety valves

Valves repaired:

Gate, Check, Disc, Globe, Plug and Safety Valves (Field Service)
Ball Valves (In-House Only)

All field grinding and lapping equipment is in a rugged carrying case ready for deployment. Thai PRO has two complete sets of field grinding and lapping equipment for backup purposes as well as leak detectors for plant inspections.

For more information, please contact Thai PRO:
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Finding a Solution that Keeps the Process Running

Buddy Morris, Global Marketing Manager
Slurry Pump Operation – Ashland, PA

US Filter had installed a waste treatment process at the Merck Cherokee Plant in Riverside, PA. The pumps installed were 14" Axial Flow units in Cast Iron construction. Ashland-based field service had participated in the original start-up.

Six months after start-up, we received a call stating the amps had dropped on one of the pumps. On Tuesday Ashland field service went to the site to investigate. The pump was opened up and inspected. The pump had experienced severe corrosion and erosion even though the pumpage was supposed to be PH neutral with minimal, if any, solids. The cast iron props (impellers) were almost completely gone.

Merck was in a bind, as this was their treatment system. To shut it down would mean shutting down the plant. A spare was installed for the one unit, however, Merck did not have a back up for the second unit. All the pumps had been installed at the same time. If the other pumps went down, they would have to start shutting down the plant.

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