Castolin Eutectic: Wear management solutions for quarrying critical assets

Advances in wearfacing technology can make quarry operations more sustainable, while increasing their profitability.

KRIFTEL, GERMANY, May 17, 2023 /EINPresswire.com/ -- Advances in wearfacing technology can make quarry operations more sustainable, while increasing their profitability. Mateusz Gierek, Technical Application Specialist at Castolin Eutectic, explains.

Mining Bucket lined with CDP Wearplates

Our on-site intervention engineers

Equipment used for extraction, processing and transport of quarried materials is subject to powerful abrasive and erosive forces, as well as heavy impact shocks and vibrations. The need for frequent replacement of worn and damaged parts with new ones may seem inevitable, but Castolin Eutectic takes a different view. Its long-held philosophy is that repairing and strengthening parts makes more sense – both economically and in terms of sustainability.

Fundamentally, discarding worn parts and using more metal to make their replacements is a waste of the earth's resources. Manufacture of new parts also consumes extra energy and adds to carbon emissions.

By extending the lifespan of wear parts, wearfacing technology – or hardfacing as it is sometimes known – not only addresses environmental concerns but saves money. It can be applied to new equipment or added later as part of a repair and restoration process which gives components a second life and a better-protected future.

Castolin Eutectic

A longer lifetime means less downtime for replacement work – saving on maintenance labour costs and lost productivity. Meanwhile, less investment is tied up in buying and accommodating large stocks of spare parts. In cases where maintaining a component's original shape optimises the equipment's effectiveness and energy-efficiency, wearfacing may bring additional benefits in relation to output, fuel economy and carbon footprint.

Wearfacing treatments
Essentially, most of Castolin Eutectic's wearfacing treatments involve the application of advanced alloys to surfaces. The compounds and structures used are carefully selected to meet the demands of each specific situation. Choices and combinations are almost unlimited.

They are applied as coatings, as welding wires or by weldable steel wearplates hardened with alloys.
These CDP (CastoDur Diamond Plates) are easily cut, shaped and fitted to protect any surface. If required, they can be pre-cut and formed into sections of a given size and shape, ready for application to the equipment. They are then simply attached using screws, rivets or spot welding. A further advantage is that individual plates can be repaired or replaced in the event of localised wear.

Like the other wearfacing solutions, wearplates are available with a variety of alloy compositions to meet different needs. An important factor in choice of these alloys is the inclusion of carbides, which add considerably to their hardness. In laboratory tests for abrasion resistance, according to the US standard ASTM G65, these CDP wearplates last five times longer than standard wearplates.

For transport of abrasive and erosive materials through pipework, another ready-made solution is available in the form of tubes that are lined with wearfacing alloys. They can be supplied in a variety of diameters and section lengths, with elbows or Y-joints as necessary, and are easy to join.

Cost-saving cooperation

Depending on their circumstances and preferences, quarrying businesses may need a full, end-

to-end wearfacing service, from inspection, analysis and monitoring of wear problems to implementing solutions. This appeals particularly to quarry operators with minimal in-house staffing for equipment maintenance. Alternatively, a company's own engineers may simply need advice, training and supply of

It should be stressed that repair of materials like cast iron and cast steel is difficult and requires highly specialised knowledge. Castolin Eutectic has a global network of 400 technical advisers with the necessary expertise to solve these wear and repair problems. Their specialisms include welding, brazing, coating and more. Wherever you are in the world, a reliability engineer can be on-site quickly to help you.

As one illustration of the cost-saving benefit of repair over replacement, it was recently noted that a digger arm repaired by Castolin Eutectic seven years ago is still working today. Repairing the large crack in this machine had required about a week of specialised welding, at a cost of €3,000. A replacement arm would have cost €25,000.
Aside from saving on the cost of replacement parts, this approach makes businesses much less vulnerable to supply chain problems. During the recent pandemic, for instance, some parts were difficult or impossible to obtain, especially from Far East suppliers. By refurbishing, rebuilding and strengthening existing components, a closed loop is created. Space, time and investment dedicated to stocking spare parts can be redirected.

Better still, the hardening processes used on new parts improve the quality of OEM parts. Not surprisingly, some customers are now asking OEMs to use the Castolin Eutectic ultra-hard materials when building machines.

Importantly, specifications for the shape and size of wearfacing linings and other pre-cut pieces can be calculated accurately, even if the equipment's technical drawing no longer exists. Using a 3D scanner and portable measuring arm, reference points are plotted and documentation is recreated fast through reverse engineering.

For a quarry business with its own maintenance team, many wear parts that would previously need to be stocked can be replaced by versatile repair kits, with advice and training to support the process. In fact, when it comes to a relatively simple task like attaching a wearplate, no great amount of specialised expertise is needed.

Measurable environmental benefits

Reducing material consumption, energy use and carbon emissions has rapidly become a top priority for quarrying businesses. The EU's increasingly stringent sustainability-related legislation has been a major driving factor, along with public pressure to protect the environment. More and more companies have ESG (environmental, social and governance) strategies and aims.

Wearfacing can help considerably in meeting environmental targets. To calculate its impact,

Castolin Eutectic has developed an EcoTest calculator. For any suggested refurbishment solution, this shows the tonnages of metal and CO2 which will be saved by preventing wear. Other ways of reducing emissions include using hydrogen instead of acetylene for brazing.

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