

ARC[®] COMPOSITES for Abrasion



ISO 9001 CERTIFIED

REBUILD, RESTORE AND PROTECT METALS SUBJECT TO ABRASION, CORROSION AND EROSION WITH ARC® COMPOSITES

Advanced technology for down-to-earth problem solving

Composites are the leading edge of materials research and development. Utilizing this technology, ARC Composites use advanced epoxies reinforced with ceramics to form a composite that is both durable and abrasion resistant. ARC Composites solve metal resurfacing problems and save millions around the world in a way that is faster and more economical than conventional technologies.

Vacuum manufactured for solid protection with no air voids

ARC Composites are manufactured using a special vacuum process that minimizes the possibility of microscopic air bubbles being trapped at the ceramic/polymer interface. This vacuum process allows denser packing of the ceramic reinforcements enabling the ARC Composites to outperform conventional ceramic-filled epoxies which typically exhibit wear around the ceramic fillers.

Advanced polymer matrix resists impact, improves adhesion

The structure of the polymer matrix is a chain of interlocking molecules which have the ability to deflect under the stress of surface impact and distribute stresses evenly throughout the hard ceramic reinforcement. Ceramic reinforcement is treated with advanced chemical coupling agents to increase adhesion for more reliable performance in real life application conditions. As a result, the compound can endure surface impact that would crack or shatter more brittle materials.

Densely packed for maximum performance

ARC Composites are scientifically formulated to result in dense packing of the ceramic reinforcement, ensuring outstanding abrasion resistance. An advanced polymer matrix binds the ceramic particles into a moldable compound that is far more resilient than ceramic alone, thus resulting in excellent energy absorption properties

Resists sliding abrasion and erosion for extended equipment life

ARC Composites combine the extremely hard wearing properties of ceramic with the resilience of a polymer matrix to deliver outstanding resistance to sliding abrasion and erosion. These types of abrasion commonly wear out equipment that handles slurries, dry powders, and turbulent fluid flow. In these applications, ARC Composites have outlasted and outperformed hard face welding, rubber liners, ceramic tiles, and conventional ceramic-filled epoxies.

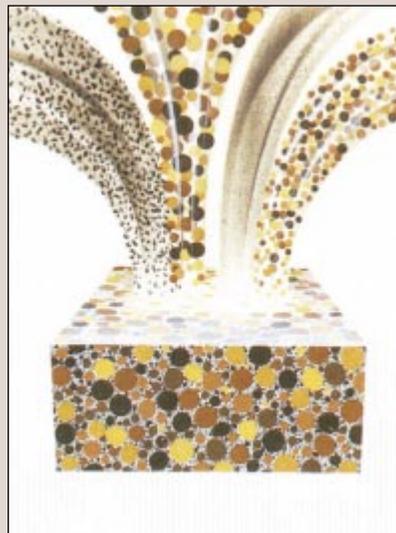
Broad resistance to chemical attack

ARC Composites are engineered to provide excellent chemical resistance properties. With few exceptions, ARC Composites can withstand the harshest of acids, H₂SO₄, HCl, HNO₃, and other chemicals. ARC Composite materials do not wear rapidly under the combined effects of corrosive agents and abrasives, which can devastate high chrome alloys.

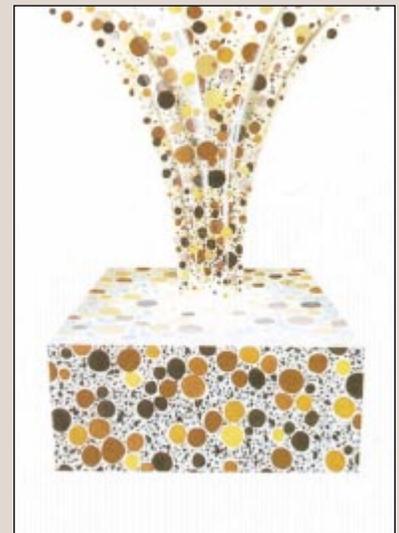
Moldable, seamless surface protection

ARC Composites applied to the metal surface cure to a smooth, uniform surface. ARC Composites can be troweled, molded or brushed on the surface. Complex shapes and critical tolerances can be attained, restoring equipment to a "better than new" condition.

ARC COMPOSITE



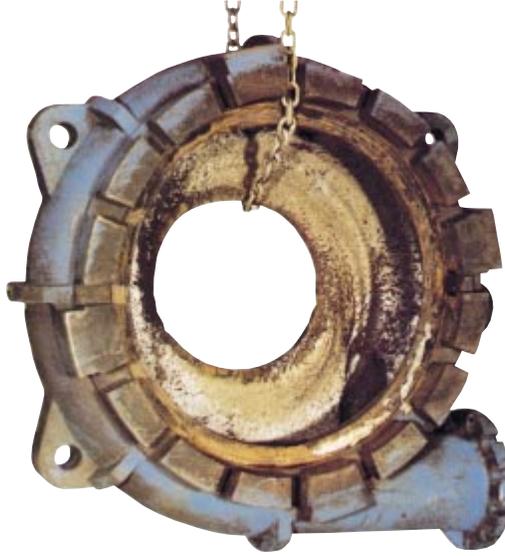
CONVENTIONAL PATCHING MATERIAL



INDUSTRY PROVEN PERFORMANCE OF ARC COMPOSITES

Coal slurry pump volutes rebuilt at half the cost of a new volute and with equal or better life expectancy

Coarse coal with magnetite, pumping at 5300 liters/min (1400 GPM), wore through volutes in an average of 18 months. Volute were rebuilt to like-new condition with ARC Composites in just over two shifts.

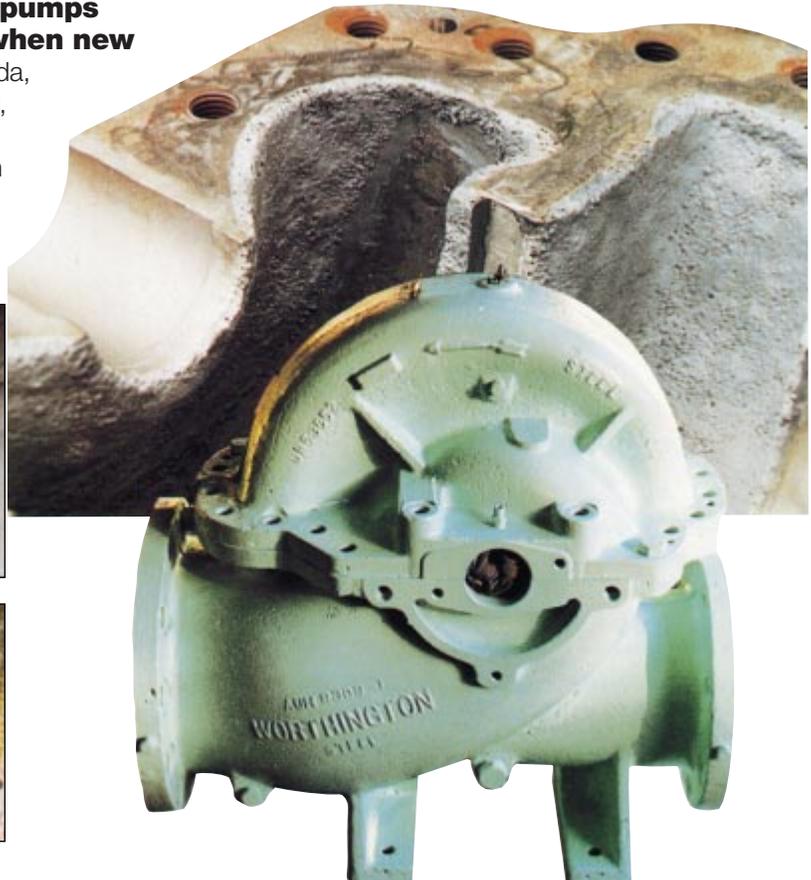


Shoulders, beveled fits and other contoured surfaces were reconstructed to original form with proper clearances.

Rebuilding, including materials and labor, was accomplished at approximately half the cost of a new volute, and with equal or better life expectancy.

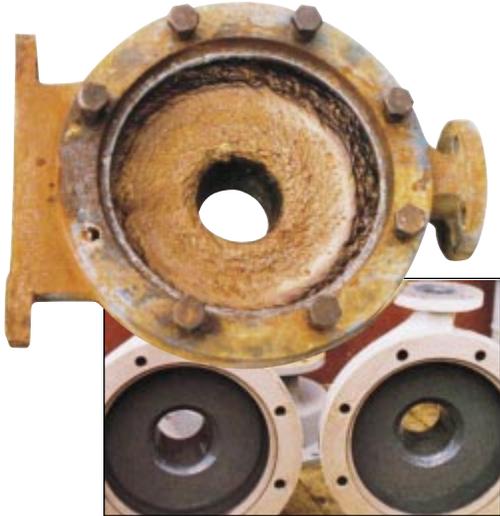
Rebuilt caustic and sand filtrate slurry pumps with service life 20 times longer than when new

The corrosive effect of hot, 90°C (195°F), caustic soda, combined with the abrasive action of a bauxite sand, created a slurry that wore through casings of new horizontal split pumps in four weeks. Rebuilding with pure nickel welding lasted only five weeks. Rebuilding them with ARC Composites costs less than welding and is lasting 18 months to 2 years.



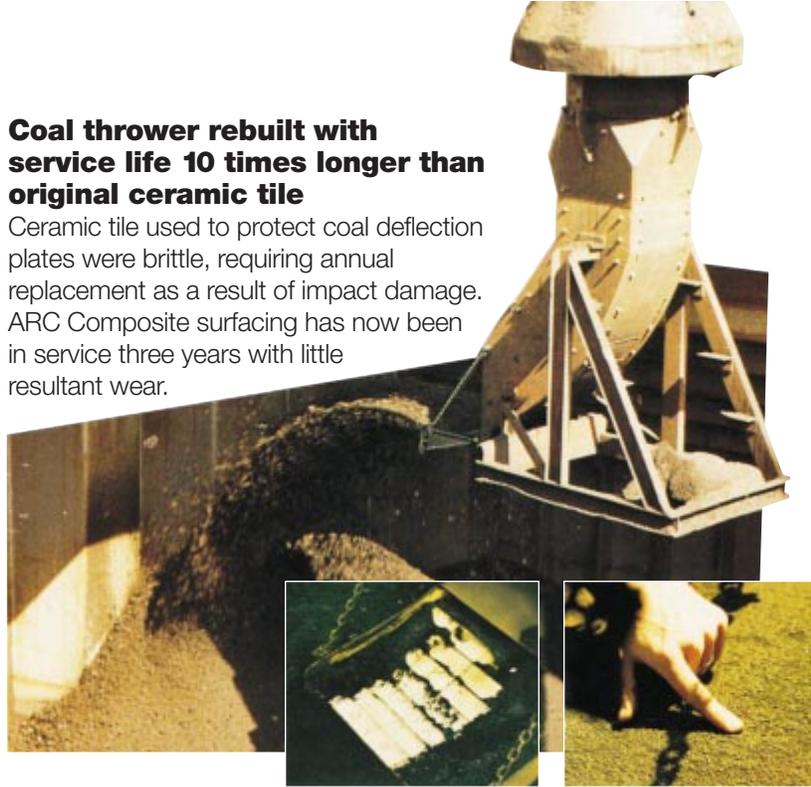
Caustic slurry pumps saved from scrap pile

Metal particles in caustic slurry destroyed pumps in about 6 weeks. Molds were used to repair multiple pumps with an ultra-smooth finish. ARC Composites improved on the original service life at a fraction of the cost of a replacement pump.



Coal thrower rebuilt with service life 10 times longer than original ceramic tile

Ceramic tile used to protect coal deflection plates were brittle, requiring annual replacement as a result of impact damage. ARC Composite surfacing has now been in service three years with little resultant wear.



Wood chip transport fan refacing doubled service life

Fan blades that needed repair or replacement every 2 months were repaired with ARC Composites and showed little wear after 4 months.



◀ Pulp screw repair avoided expensive stainless steel welding process

Conveyor screw required stainless steel welding repairs bimonthly. ARC Composite rebuilding of precise contours showed only wear along the edges after two months and was returned to operation without further repair.

Slurry transport ▶ pipes restored with ARC Composites

Smooth surfaces reduce turbulence. Elbows and Y's, highly vulnerable to abrasion, are effectively protected by ARC Composites.



ARC Composites out-performed hard-face welding

Phosphate mine dredge pumping is a tough process. Volutes and casings wear out rapidly in spite of hard-face welding repairs.

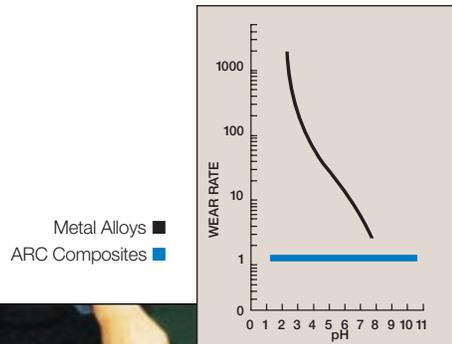


ARC Composites now resist the corrosive, abrasive slurry, lengthening the maintenance interval. Smoother surface improves flow.



ARC® COMPOSITES

Specifically engineered to protect your plant's equipment against the costly problems of abrasion, corrosion and erosion...



Wear resistant metals corrode, erode and wear out

Abrasive particles in an erosive process continually strip off the protective oxide layer, wearing away the base metal.

This process of wear is dramatically accelerated by the combined effect of chemicals, abrasives and temperature.

ARC Composites exhibit excellent chemical resistance, resulting in ultimate abrasion protection throughout the entire pH range.



Rubber liners disbond from the metal, tearing and shredding

Abrasive action cuts into the liner, leading to tears and rapid attack of the metal underneath.

ARC Composites form an abrasion resistant surface that doesn't tear or shred and consistently outperforms rubber liners.



Brittle ceramic tiles crack and fall off the surface

Typical abrasive processes can damage, chip or dislodge ceramic tiles, which are difficult or impossible to replace or repair.

Ceramic reinforced ARC Composites create a uniform, durable surface.

Securely bonded to the base metal, ARC Composites are easy to maintain and rebuild.

ARC® COMPOSITES FOR ABRASION

Performance engineered
for metal rebuilding
and resurfacing



Engineering assistance for perfect results

Technical Specialists can work with you and your crew, or the contractor of your choice, to make sure that you get the best application results. From product selection to application training, to on-time delivery, the Specialist will be there to help you get equipment back into operation fast and in a cost-effective manner. All of these abrasion, erosion and corrosion repairs can be carried out on-site, with no heat, special equipment, or expensive personnel. Maintenance repairing can be performed by your own staff or by ARC service partners.

Ask your local Factory-Trained Specialist about the following services:

- In-Plant Seminars
- Training Programs
- Return-on-Investment Analysis
- Equipment Performance Evaluation
- Product Recommendation
- Pump and Equipment Surveys

Proven applications:

- Slurry pumps
- Wear plates
- Transport chutes
- Hydro pulpers
- Pipe elbows
- Screw conveyors
- Turbo separators

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FORM NO. E75410 REV. 3

PRINTED IN USA 3/98