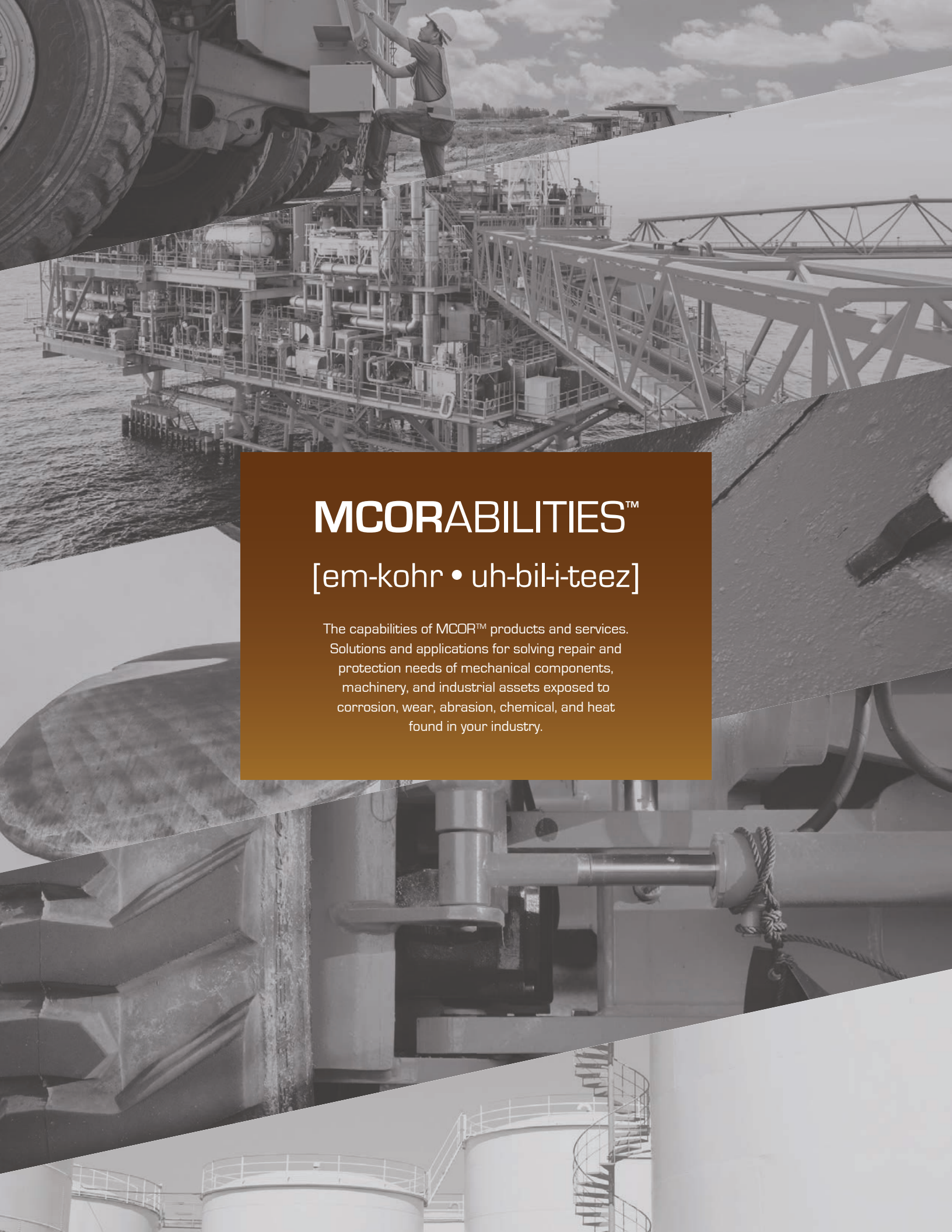


MCORABILITIES™

[em-kohr • uh-bil-i-teez]

The capabilities of MCOR™ products and services. Solutions and applications for solving repair and protection needs of mechanical components, machinery, and industrial assets exposed to corrosion, wear, abrasion, chemical, and heat found in your industry.

MCORABILITIES™
for Pumps & Fluid Flow

MCORABILITIES™
for Mechanical Equipment & Heavy Machinery

MCORABILITIES™
for HVAC

MCORABILITIES™
for Storage & Containment

MCORABILITIES™
for Marine Vessels

MCORABILITIES™
for Offshore Structures

MCORABILITIES™
for Solids Material Handling & Transferring

MCORABILITIES™
for Buildings and Structures

MCORABILITIES™
for Pumps & Fluid Flow

MCORABILITIES™ for Pumps & Fluid Flow

Pumps ready for delivery, specified with high performance internal component coatings from MCOR's advanced ceramic and titanium protection series.

Everybody involved in pumps and flow systems understands the essential role they play in the process and production of almost any industry– the backbone of many operations; they must remain resilient, efficient, and productive. Yet, these workhorses also come with a high price tag, making up a major portion of capital expenditures in any processing industry – oftentimes accounting for up to 20 to 25 percent of all the components.

Because of the high initial expense and replacement costs of flow systems, MCOR now affords the option of rehabilitation versus replacement which warrants the attention of all parties. This puts a premium on your maintenance personnel by allowing them to employ a comprehensive program to troubleshoot and apply a variety of effective repair methods when dealing with equipment as it progresses through the shop. The more in-depth a rehab program is, coupled with proactive repair and protection routines, the by-product will equate to a maintenance culture that will yield exceptional results and return on investment.

Although pump and flow handling equipment can be a driver of production for many years, pump and flow system performance will decrease after prolonged, heavy duty or aggressive service life due to several forces at work– erosion, corrosion, chemical attack, microbial induced corrosion, abrasive wear, and cavitation. When that occurs, operations experience costly downtime, repair expenses, and underperforming production– all of which can drive up costs.

Fortunately, these outcomes can be resolved by making **uncomplicated repairs** and putting simple and cost-effective maintenance measures into place, making a big difference in improving downtime, performance and extending the system's lifecycle.

Cut-water blades badly worn from years of service. MCOR's reclaiming and rebuilding compounds, together with MCOR Reinforcement, renew these blades back to original form.

Pump suction bell in dire need of surface renewal and protection with MCOR polymers to return the structure back to service better than it was originally, this time protected against corrosion and cavitation.

These casings are lined up on a workbench waiting for quick and simple “cold” metal filling for metal loss reclaiming and ceramic coating protection.

Eroded cast iron does not always warrant replacement; instead renew, restore, and improve the flange faces and eroded cylinder surfaces with MCOR’s advanced cold-applied polymer compounds.

MCOR offers a practical range of solutions for extending pump maintenance cycles and life expectancy while utilizing simple, rapid and effective repair methods combined with high performance coatings while decreasing the energy burden of fluid flow.

Let us prove why our high-performance, advanced polymers will save you valuable time, money and resources. The team at MCOR has been pioneering the industry for more than 40 years, serving thousands of clients across the globe. Our solutions are time tested, proven and cost-effective in **repairing and protecting your pump and flow structures damaged by corrosion, abrasion, chemicals, wear and cavitation**.

MCOR will provide you with an arsenal of solutions in the repair of pumps and components while relying less on creating a spare parts inventory. You’ll immediately realize exponential savings that will impact the bottom line and reflect a prudent and sound return on your investment.

MCOR'S INDUSTRY LEADING "COLD" REPAIR AND PROTECTION SOLUTIONS

Wherever erosion, cavitation, impingement, abrasive wear, microbial or chemical attack or other kinds of corrosion manifest themselves in fluid flow systems, MCOR's advanced mechanical polymer compounds provide the optimal solution. By utilizing our total systems' pump repair and protection approach and products, MCOR helps lower total operating costs by quickly repairing components with cold-methods while optimizing the performance, reliability and service life of your pumping and fluid flow system.

MCOR is one among many that advocate preventive maintenance, repair and rehabilitation over replacement- especially when these methods are safe, quick and uncomplicated while delivering cost-effective performance. Doing so with MCOR solutions provides these benefits:

▪ Cost-effective, simple and safe to use, **"cold" repairs and reclamation** with highly engineered, advanced metal polymer compounds. Allows for rapid repairs, filling, reinforcement, and metal reclamation for a rapid return-to-service while maintaining the integrity of the original state of metal and metallurgy by avoiding heat or welding.

Highly modified blends of metal alloys and ceramic are utilized within our advanced polymer pastes offering high strength, machinable-grade "cold" repair solutions for metal-like cladding, renewal, filling, reclaiming and rebuilding.

Various sections of a cut-water being examined and repaired; including the shaft sleeve housing, interior cylinder walls and blades.

Sloppy key ways and eroded out holes can be rapidly restored with MCOR polymer compounds and reinforcement materials.

Eroded metal undergoes surface renewal with advanced anti-wearing epoxies for quick and cost-effective "cold-weld" reclamation.

Wear plate entirely reclaimed and protected.

- Depicted is a pro-active maintenance cycle culture that incorporates **high performance coatings for protection.** Utilizing and employing renewal and improvement methods that enhance flow also guards against cavitation. These methods will provide measurable results by protecting against corrosion, wear and abrasion with ceramic and other enhanced coating systems, thus reducing down-time and maintenance cycles.

Sewer cut-water now protected with simple-to-apply two coats of MCOR.

Various flow components being coated for protection against chemicals, gases, and other corrosive elements.

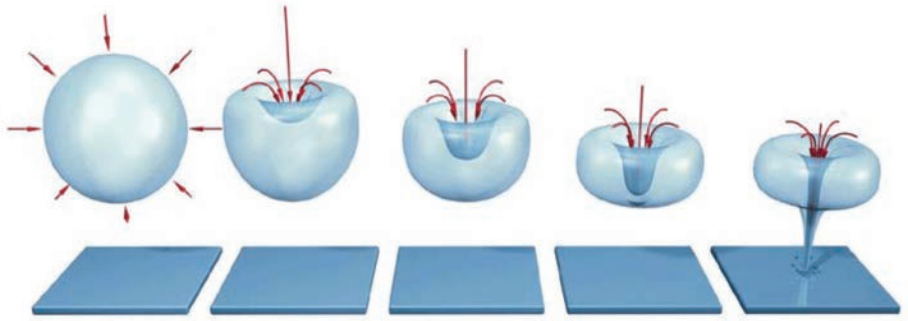
CAVITATION SOLUTION

Wherever corrosion creates a problem in a fluid flow system, MCOR's advanced and high build polymer compounds deliver the perfect solution.

High flow velocities encountered in fluid handling equipment adds to the quick degradation of the pump and corresponding components. In some cases, high fluid velocities occur due to high pressure to low pressure leakage. In other cases, silts and gravels can be carried in the fluid stream with the resultant factor accelerating erosion and material loss.

The effects of moving abrasive liquids or materials are similar to corrosive liquids. Handling abrasive liquids is a difficult application for any pump, because the abrasive particles promote pump wear. Both corrosion and abrasion remove some of the material the pump itself is constructed of. Heavy wear systems, such as sludge or sewage pumps are particularly prone to abrasion wear. Flow velocity, corrosives and abrasives are typically at the root of accelerated wear and eroded metal, when coupled together, metal loss is rapid. To tackle these culprits requires coating technologies usually armed with ceramic and other anti-abrasives.

Cavitation can also occur as a result of a pressure difference in the fluid and is most often found on either the pump body or impeller, in particular the low pressure surfaces. Vapor bubbles formed by the pressure drop at the eye of the impeller have the potential to abruptly collapse – this process of formation and subsequent collapse of vapor bubbles results in small pits or divots which build up over time and begin to damage the pump equipment.



Cavitation bubble imploding close to a fixed surface. The bubble generates a jet with surrounding liquid, which blasts away at metallic surfaces. Multiplied by constant bubbles generating in fluid flow systems equates to a highly erosive effect.

Cavitation in a centrifugal pump has a significant effect on pump performance. Cavitation degrades the performance of a pump, resulting in a fluctuating flow rate and discharge pressure. It can be destructive to a pump's internal components. Cavitation can also cause excessive pump vibration, which could damage pump bearings, wearing rings, and seals - not to mention the foundation on which they are secured or anchored.

The solution to pump impellers suffering from cavitation is finding a material that can withstand high pressure levels and endure harsh environments. Materials such as MCOR's polymer repair pastes will rebuild the cavitated metal, while MCOR's ceramic coatings will provide lasting protection against future erosion.

ROUTINE MAINTENANCE VS. REPLACEMENT

The reality today is that it's virtually impossible to design a system which is totally immune from in-service deterioration or corrosion. So the question becomes the following: how do operators extend the length of time before a maintenance shutdown and perform a repair the most effective way for the best return on investment while minimizing downtime?

MCOR can effectively lengthen the life cycle of your pump and flow system. Our advanced coatings and repair polymers diminish the costs associated with the different stages of a pump's lifecycle. With repair, rehabilitation and high performance protection, you'll be able to incorporate an extremely cost effective preventative maintenance program that will ultimately reduce both downtime cycles and man hours while increasing efficiency and performance.

WHY LIFE CYCLE COSTS (LCC) MATTER

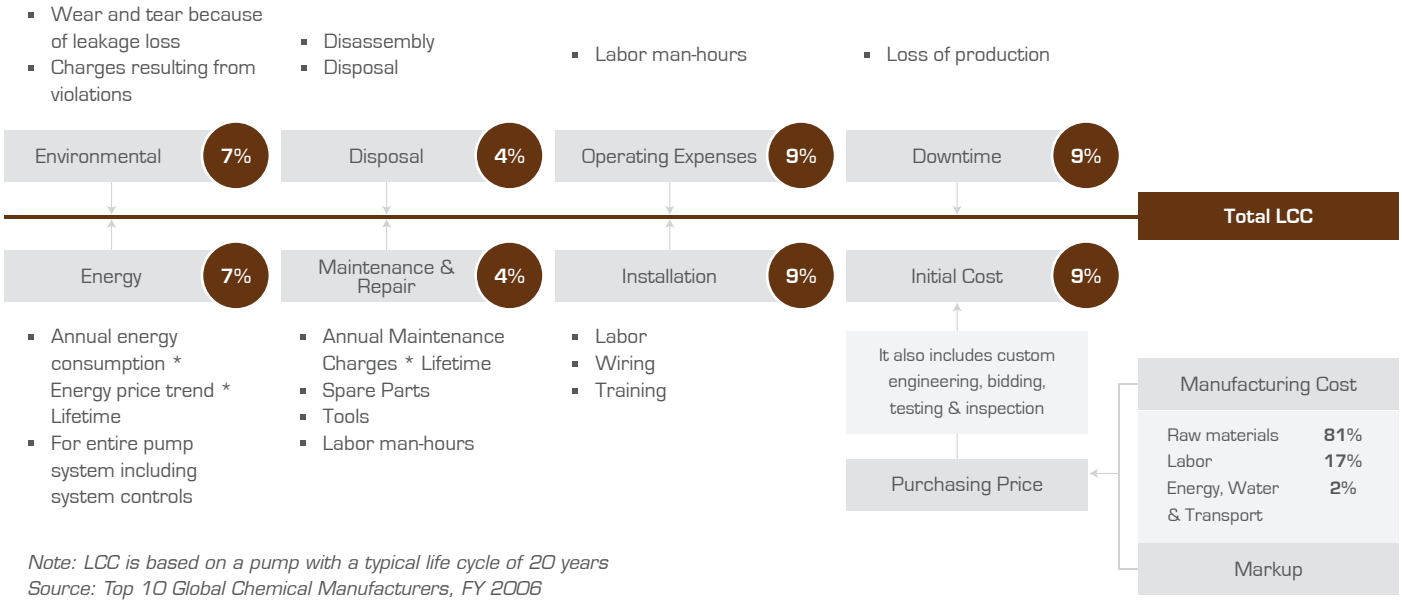
LCC is the total cost associated with an industrial pump from the point of procurement up to the point of decommissioning and disposal of the installed pumping system.

It is an important tool to help plant managers choose between alternative resources and decide between repairs versus a new purchase.

The purchasing price is only a small part of the total LLC of any industrial pump, but other operating costs- such as maintenance, repair and energy account for nearly half of it.

Most pump users make procurement decisions based on the initial purchase cost, which is often only 10 percent of the total LCC.

Organizations with a ROI focused management do not purchase pumps based on their initial purchase and installation costs. Instead, they focus on the total LCC of a pump, which is five times greater than the initial expense and installation costs.



Note: LCC is based on a pump with a typical life cycle of 20 years
Source: Top 10 Global Chemical Manufacturers, FY 2006

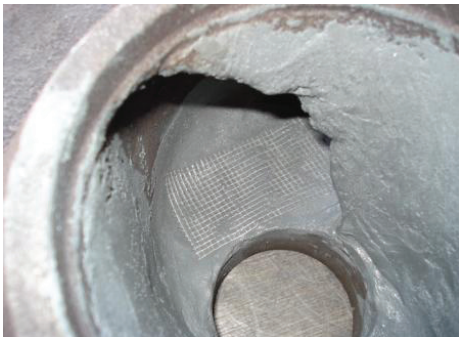
MCOR™ IN ACTION

BEFORE & AFTERs

Cavitated cast-iron suction bell being prepared, undergoing metal loss reclamation, and then receiving two coats of high performance coating for re-deployment in harsh sewer systems.

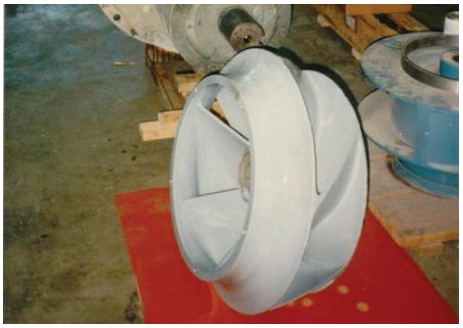
Shaft support arms of a circulating cooling water pump for the cooling system of a power plant. Removed from its submersed home, and restored with MCOR polymer reclaiminig compounds.

BEFORE & AFTERs



Holes in this impeller were repaired with MCOR's advanced polymer compounds resulting in a better than new repair while providing an extremely durable ceramic and hydrophobic coating.

Cut-water blades, cylinder walls and shaft housing rebuilt with various grades of MCOR's polymers and reinforcement materials.



An impeller restored with a metal reclamation procedure and enhanced with a ceramic coating for increased protection and rapid return-to-service.

1000 Series | mCoat™

Industrial-grade Protective Coatings

High performance coatings and liners for protection in harsh environments

The **MCOR 1000 Series | mCoat** provides the most advanced protection on steel components for industrial use. Our epoxy coatings are utilized for the harshest and most aggressive and corrosive applications, especially when immersed. They help protect against the most volatile acids, hydrocarbons and caustics while enhancing various tolerances with a high film build while increasing wear and heat tolerances.

The high performance, immersion-grade advanced epoxy coatings feature:

- Ease of application by brush, roller or spray
- Applied at high build film thicknesses for protection in harsh environments
- Resistant tolerance, often used on non-immersed splash areas and / or components submerged in chemicals
- Heat tolerant and chemical resistant

The MCOR™ 1000 Series provides this immersion pump the proper level of high film build protection and advanced protection for abrasion, chemical, and constant immersion in both caustic or acidic environments

Protective coating systems by MCOR include:

- **MCOR 1110 | mCoat IM**
  Immersion-grade, industrial coating for corrosion protection.
- **MCOR 1161 | mCoat IM 61**
  Immersion-grade, industrial coating for potable, drinking water environments (NSF-61 Certified).
- **MCOR 1230 | mCoat IM HT**
  Immersion-grade, titanium/phenolic novolac hybrid with high heat tolerances.
- **MCOR 1298 | mCoat IM Plus**
  Immersion-grade, 100% phenolic novolac protection for high chemical resistance.

2000 Series | mPlait™

Advanced Performance Ceramic Coatings

High performance coatings and liners for internal mechanical components

MCOR's ceramic coatings provide long-term erosion-corrosion protection and improve pump efficiency by using this advanced polymer technology to repel process fluids and reduce turbulent flow. Our **2000** Series | mPlait includes high performance coatings and liners for internal mechanical pump and fluid flow components, resulting in drive efficiency increases on equipment while reducing the frequency of maintenance costs.

MCOR's protective coatings offer outstanding anti-wear and anti-abrasion linings by incorporating high levels of advanced dense ceramics and other proprietary fillers. Their ability to cure quickly with incredible bond strength, high chemical resistance and non-shrink properties make them ideal for protecting your pump systems in environments with pressure, vibration and extreme suction and undulation.

MCOR's 2000 Series | mPlait uses a coating technology specifically designed to meet the demanding service requirements of industrial pumping systems, while simultaneously providing solutions and utilization methods that will increase efficiency and streamline your maintenance efforts.

- **MCOR 2101 | mPlait MP**

  General purpose flouroceramic coating for multipurpose interior protection of components requiring a self-leveling hydrophobic finish, or for thinner precision build applications needed for tight-fitting areas or components.

- **MCOR 2555 | mPlait X**

  Ultra-high performance, high build flouroceramic coating for severe interior abrasion requirements or exposures to high heat and chemicals.

Regardless of the abrasion a volute undergoes, MCOR's product portfolio will have a high performance coating to protect it.

Gate valve housing being reclaimed and coated.

Wear ring housing and volutes of a split case pump, now armed for abrasion combat.

Sewer impellers restored and coated with MCOR ceramics. Better than new.

3000 Series | mClad™

Reclaiming & Cladding Polymers

Advanced, high build repair polymers for precision reclaiming, metal filling and/or high build wear cladding

Erosion and cavitation can cause damage to pump bearings, wearing rings, and seals. It can also result in excessive pump vibration. Centrifugal pump bearings are typically subjected to high axial loads, marginal lubrication and high operating temperatures and vibration – all while attempting to minimize friction. While these moving parts are engaged, foreign objects can enter, friction rises, metal loss from corrosion and debris start taxing the metal and system. Although the consumables can be replaced easily, the fixed assets, and static cast or forged parts, housing areas or casings will require a more creative method of repair, outside the realm of replacement. This calls for rehabilitation and repair to reclaim the shape and integrity of the fixed metal part - precisely where MCOR can help.

If uncontrolled, friction can result in power loss, excessive heat generation, increased vibration and /or wear, including premature bearing failure. All of these dynamics can dramatically affect the service life and reliability of bearings and pumps. Our unmatched polymer technology, combined with our engineering expertise, has allowed us to create one of the highest performing and comprehensive lines of polymer systems available for rebuilding, reclaiming, metal filling, resurfacing and the cladding of these critical components.

The MCOR 3000 Series | mClad offers engineering-grade, reinforced and densely filled epoxy compounds for repair, rebuilding and reclaiming. Products in this line provide advanced wear resistance, cladding and sealed corrosion protection, while others offer the ability to be drilled, tooled, tapped, filed or machined for the repair of engineered pump parts and fluid flow equipment that require precision finishing and dressing. Once cured, the material replaces worn or lost metal while providing you with a metallic profile with high strength bonding, reinforcing as a cold-weld alternative and maintaining the integrity of the original metal.

The MCOR 3000 Series | mClad metal repair and reclaiming compounds help:

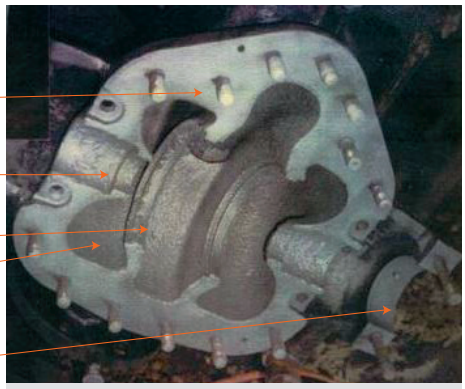
- "Cold" metal resurfacing and filling.
- Rebuild components and parts without the need of specialist tools.
- Restore and reclaim with form-mold techniques.
- Avoid the need for "hot" work that warps the metal.
- High strength structural adhesive for metal bonding, including stainless steel, carbon steel, aluminum, cast iron and bronze, as well as specialty alloys.
- Creation of irregular load bearing shims.
- Great alternative to sacrificial steel plating and lining.
- Realize an increase in pump efficiency and performance.

MCOR repair, reclaiming, and cladding compounds include:

- **MCOR 3115 | mClad mFill**
  Multipurpose, general metal filler, resurfacing and restoring compound.
- **MCOR 3310 | mClad Metal**
  A fully machinable-grade, all-metal-filled product for most ferrous applications.
- **MCOR 3330 | mClad Ceramic Metal**
  A fully machinable-grade, all-ceramic-filled product for repairs requiring inert fillers.
- **MCOR 3880 | mClad xWear Alumina**
  Wear area restoring cladding compound with alumina filled anti-abrasives (stand-alone system, often for pipe elbows or reoccurring wear channels).

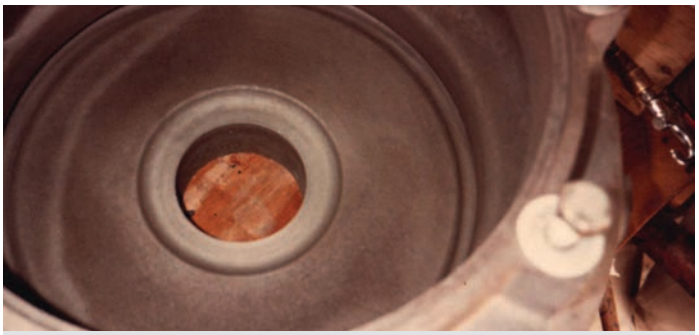
COMMON PROBLEM AREAS WHERE MCOR'S METAL RECLAIMING COMPOUNDS PROVIDED THE SOLUTION TO A "COLD" REBUILDING AND REPAIR APPLICATION:

1. Shaft sleeve housing
2. Flanges
3. Packaging housing
4. Wear ring housing
5. Volutes
6. Bearing housing



Eroded, corroded pump case and housing areas in need of cold-weld reclaiming and reclamation.

COMMON PROBLEM AREAS WHERE MCOR'S METAL RECLAIMING COMPOUNDS PROVIDED A "COLD" REBUILDING AND REPAIR SOLUTION:



Wear plates

Cracked and deteriorated pipe walls, elbows, and various flow components

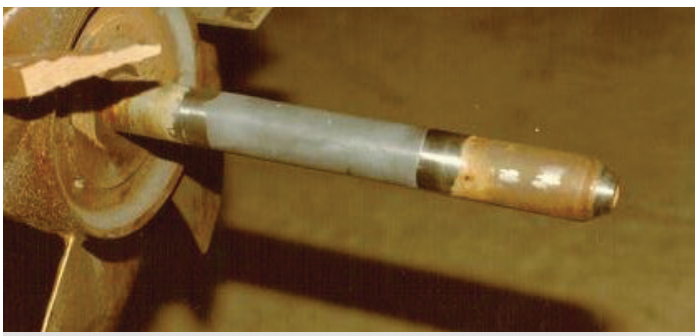
Reformed sloppy key ways (mold-in-place)

Eroded valves and seats (butterfly, check, gate, etc.)

Eroded impellers and cut-waters

Corroded flange faces

Worn and cracked pump casings



Scored or worn shafts

4000 Series | mFlex™

Polymeric Elastomers

Repair and life extension of flexible components

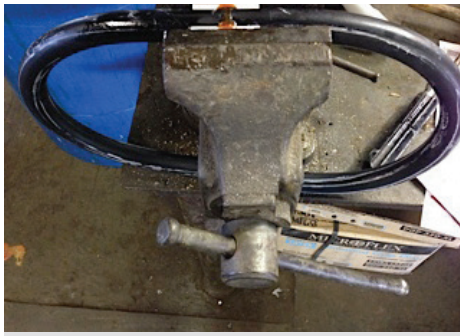
MCOR's 4000 Series | mFlex are high performance elastomers for sealing, rebuilding, repairing or creating rubber components with a cold cure solution and elimination of vulcanization processes.

These flexible rubber repair materials are ideal for applications where high build, durability, elasticity and compressed seals are needed.

Cavitation can also cause excessive pump vibration, which could damage the foundation on which pump systems sit or on which they are anchored. MCOR offers vibration absorbing foundation and anchoring grout solutions from the 4000 Series.

Oftentimes these solutions come in handy when your fluid flow systems are in need of a quick and effective sealing solution or repair.

MCOR Polymeric Elastomers address repairs requiring flexibility around flanges, gaskets, seals, rubber repairs or custom solutions.



Rubber O-Ring tear, clamped and being repaired by MCOR 4000 Series Polymeric Elastomers.

Easily refurbish floating flanges and protect them before immersion.

Employ the 4000 series to repair expansion joints, mechanical seals and other flexible needs.

The 4000 Series can be used in the casting and fabrication of custom gaskets, pads, diaphragms and conveyor belt repairs.

5000 Series | mCrete™

Polymeric Cements

Repair and life extension of concrete and masonry components

MCOR's 5000 Series | mCrete, polymer concrete solutions specifically designed to tackle the toughest concrete problems. These include solutions for deteriorated concrete, impact, vibration, and rebar-induced spalling, chemical spillage, leaks or splash problems, as well as hydrostatic pressure situations and retaining walls.

Areas such as drains, foundations, saddles, and other support structures at times are constructed with concrete and used to secure or support fluid flow systems. When these systems leak and splash, rebar deteriorates and swells within the concrete, creating cracks and spalls that call for a polymer repair and protection. Excessive vibration will often result in anchoring and foundation issues that can be rebuilt with organic polymer permanency.

The MCOR 5000 Series | mCrete includes polymeric cements that repair and extend the life of concrete and masonry components. Our fast-setting products are able to seal, repair and protect various exposed surfaces, cracks, spalls or sectional deterioration on masonry structures, providing exceptional properties for waterproofing, chemical resistance, adhesion and repair.

Concrete anchoring slab repaired and restored with MCOR 5000 Series | Polymeric Cements.

MCOR Polymeric Cements are great material solutions to repair concrete cracks, voids and deterioration around pump anchors, mounting slabs and numerous other problem areas.

- Injectable epoxy concrete repair polymers for multipurpose repairs to masonry, ideal for crack filling, grouting, sealing and bonding of equipment.
- High build epoxy concrete repair for form filling damage and resurfacing degraded areas.
- Permanent restoration of concrete or masonry surfaces.

DISCOVER THE DIFFERENCE OF HAVING MCOR™ ON YOUR SIDE

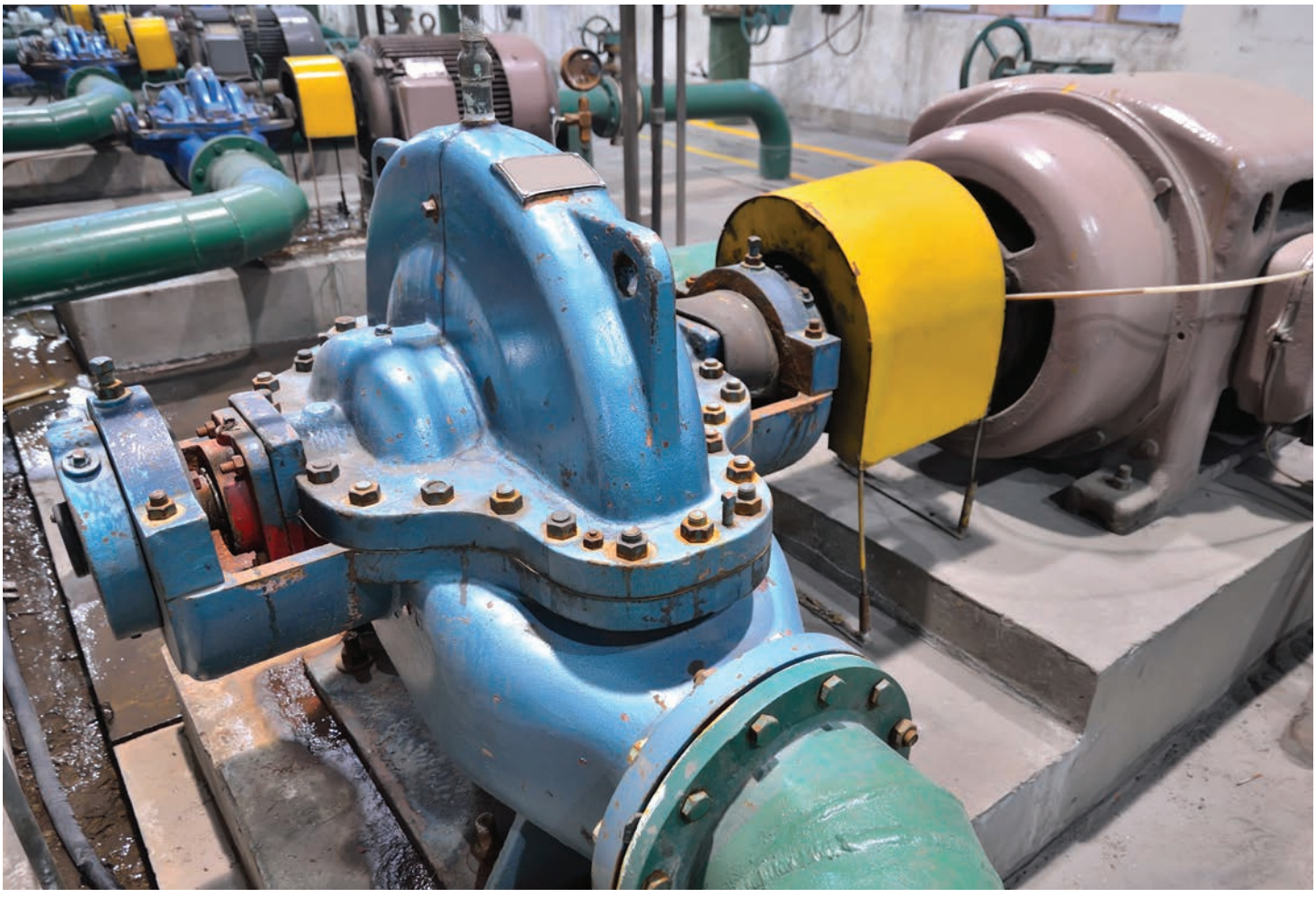
MCOR Decreases:

- Wear and tear
- Labor man-hours
- Loss of production
- Energy loss (poor flow)
- Re-occurring maintenance cycles

MCOR Enhancements:

- Cost-effective and easy-to-use cold repair
- Maintain the original metallurgical integrity by avoiding repairs with heat
- Enhanced pump and fluid flow
- Protection against corrosion and abrasion
- Preventing cavitation

MCOR Protection & Maintenance Solutions that allow for quick repairs and protected enhancements that lasts beyond typical 20+ life cycles, requiring less man hours, and with fewer shutdowns.



MCORABILITIES™
for Pumps & Fluid Flow

MCOR™
Advanced Mechanical Polymers

3000 N 29 CT Hollywood, FL 33020
T: 888.961.MCOR (6267) I F: 954.961.2395

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