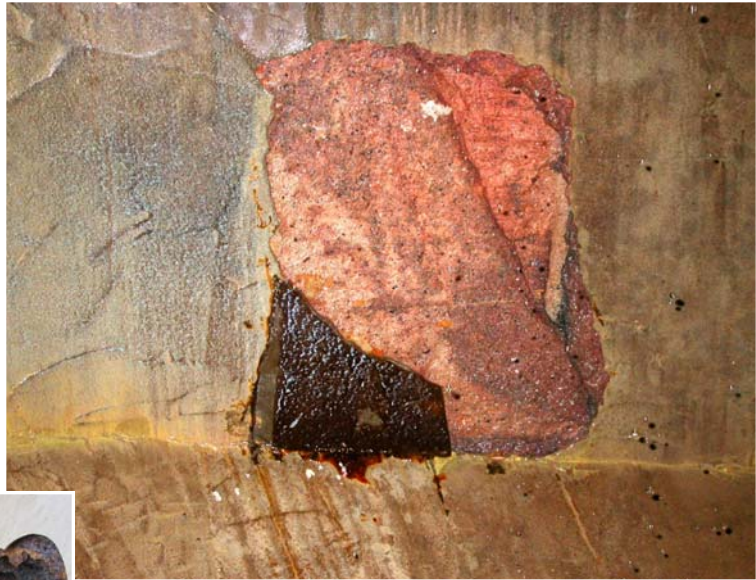


COATINGS and LININGS INSPECTION SERVICES



- *Evaluate the condition of a coating or lining*
- *Identify the failure mechanism*
- *Select the best material for repair*
- *Provide QA/QC services for application*

The breakdown of a coating or lining can often result in a catastrophic failure. This can be caused by improper material selection, improper application, poor quality control during installation or lack of maintenance. Periodic inspection of coatings and linings can ensure performance and integrity, and minimize the likelihood of failure.

Coatings and linings are often applied to tanks, piping systems and structures to prevent corrosion caused by atmospheric conditions and product. External coatings, such as paint, are generally applied to provide protection from

environmental conditions. Internal coatings and linings protect the structure from corrosive attack, erosion, or corrosion pitting. For example, acid brick or tile are often used to prevent contamination of concrete towers. FRP, polyurea, or epoxy are used as liners for similar reasons, usually in smaller tanks. The decision as to which is more appropriate is often determined based on cost, life expectancy, pH, and temperature.

A visual examination is the primary technique used in the evaluation of any coating or lining. With paint, dry film thickness measurements and



pencil hardness testing may be done. Gloss retention is also evaluated, as this can affect the UV protection capabilities. These techniques are often used when assessing the condition of an external protective surface.

The technique for evaluation of an internal coating or lining varies, depending on what is in place. For plastic liners (epoxy, FRP, polyurea), a visual examination is done to look for evidence of cracking, delaminations, inclusions, or surface irregularities. Tapping of the surface is also done to determine soundness. Dry film thickness testing may be appropriate, along with Barcol hardness testing.

The condition of an acid brick or tile lining generally involves visual inspection to determine the condition of the grout, and tile or brick. The grout is assessed for consistency and depth. The surface of the tile is inspected for cracks, spalling, softness, heaving, or other conditions that might indicate damage. Soundness testing with a hammer is also done to identify any disbonding or separation from the substrate. Routine and periodic inspection of coatings and linings can result in timely maintenance, and avoidance of failures.

Usually, linings are installed during fabrication. Often, a lining may be installed after years of service, in an attempt to provide a protective surface where the originally designed one has failed. This might include installing a plastic liner over brick or tile that has become porous. In some cases, a free-standing FRP insert is installed, which is both structural and protective. This is generally done when the structural integrity of the tank is in question, and where replacement costs are prohibitive.

A good QA/QC program is essential to assure the quality of a coating or lining installation. Of particular

concern should be the preparation of the existing substrate. A thorough review of the repair specification is recommended, and all phases of the repair, from surface preparation to final application and inspection, should be monitored.

M&M Engineering has the expertise to evaluate the condition of coatings and linings, identify the failure mechanism, and specify the appropriate repair methodology.

Onsite inspection is often part of a preventative maintenance program. This can help save money spent on unplanned downtime or unnecessary preventative repairs.

M&M Engineering's goal is to minimize repair costs by extending the intervals between inspections whenever possible.

Our **MMPIRE** program readily lends itself to the management of the information gathered during the inspection or repair process.

MMPIRE – **M**aintenance and **M**anagement **P**rogram for **I**ntegrity and **R**eliability of **E**quipment – is an asset management program that combines our engineering expertise with our inspection and management skills.

MMPIRE helps assemble and manage the preventative maintenance information in a very user-friendly way. A secure, web-based database program, it can be accessed by our clients through our website. The secure database contains information about facility's equipment—design and operational specifications, photographs and drawings, inspection reports, repair or modification information, inspection protocols and engineering evaluations.



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