



Corrosion Protection and Prevention Solutions Sourcebook

Real-World Rotational Lining Applications

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Introduction to RMB Sourcebook

At RMB Products, we help your company increase uptime by providing corrosion- and abrasion-resistant liners for pipe, vessels, and other process equipment. Our proprietary resins and years of production process knowledge enable us to produce durable, high-quality thermoplastic parts for corrosion protection applications.

For over 30 years, we have engineered solutions that address our clients' most challenging problems in the following industries:

- Chemical processing
- Mining and fracking
- Oil and gas
- Water handling
- Desalination

We also specialize in corrosion protection for electronic chemical, semiconductor, and other high-purity applications.

We use thermoplastic resins and a process called rotational lining to create a long-lasting liner inside vessels and pipe with complex geometries, large diameters, and lengths up to 20'. We install thermoplastic liners in pipe, tanks, pressure vessels, scrubbers, fittings, pumps, valves, flowmeters, filter housings, heat exchangers, and other custom process equipment.

Advantages of Rotational Lining for Corrosion Protection

Rotational lining protects equipment against mild abrasion and aggressive, corrosive materials, such as:

Acids (hydrochloric, hydrofluoric, nitric and sulfuric)
Caustics (sodium hydroxide)
Sulfides (hydrogen sulfide)

Halogens (chlorine, bromine)
Brine
Seawater

Advantages

- Complex parts are easily lined without access to internal surfaces
- Seamless liners eliminate failure prone weld joints
- The liner has a mechanical bond, which eliminates the need for adhesives, thereby reducing the risk of disbonding of the liner
- High structural integrity of the part is maintained
- Easy to seal flanges with reduced risk of leak in operation
- Operating temperatures allowed through the full temperature range of the chosen thermoplastic liner
- Durable thick liner (up to 0.50"**) offers abrasion protection, impact resistance, and corrosion protection against most chemicals
- Rotational lining creates liners that can withstand vacuum

Disadvantages

- Complex internal components, such as large baffles, are difficult to line
- Rotational lining is a shop process, which means the liner cannot be installed in the field
- The size of equipment that can be lined is limited to the dimensions of the rotational lining oven



The RMB Difference: Rotolining Manufacturing

Value-add services

including ASME-certified fabrication, to save you time and eliminate additional expenses

Engineering expertise

to develop tailored solutions to meet your specific needs

In-house testing

to ensure your product is compliant

Proprietary resins

manufactured in-house, are designed to meet the requirements of your application

ISO 9001-2000-certified

Quality Management System

Flexibility

to meet your rigorous installation deadlines

Over 30 years

of experience rotolining process equipment



Seamless Liner Increases Quartz-Processing Vessel Service Life Over 450%

Challenge

Since 2001, RMB Products has maintained a close partnership with a company that uses process vessels to tumble high-purity quartz and micro crystalline silica in an acidic solution. This tumbled quartz is eventually used to make glass crucibles for the semi-conductor industry.

During the tumbling process, four carbon steel vessels are running simultaneously for 18 hours at a time at a maximum service temperature of 210°F (98°C). This process, combined with the acidic solution, causes an extreme amount of abrasion and corrosion to the interior of the vessel.

Before 2001, the company was using 0.09" thick PTFE sheet lining inside the vessels to protect against corrosion. Typically, these liners were failing every 3-6 months, but in one instance, a liner failed after the very first 18-hour cycle. In every failure, corrosion to the liner was allowing the acidic solution to leak behind the liner, causing the adhesive to detach from the vessel wall.

While the liner was being replaced off-site, one of the two spare vessels was utilized. If another liner failed during that time, the company was at risk of losing production capacity.

Solution

RMB lined three different sizes of vessels for this company:

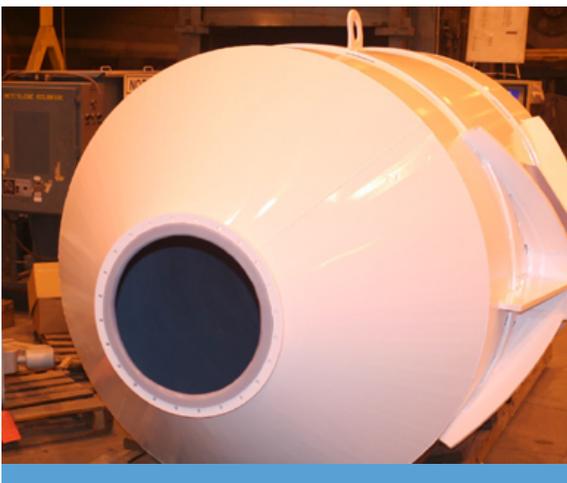
- 60" diameter x 118" length
- 72" diameter x 104" length
- 84" diameter x 120" length

In RMB's rotational lining process, a vessel is rotated in an oven, allowing gravity to spread a layer of molten ETFE polymer on all internal surfaces. This creates a seamless lining that fully bonds to the metal substrate and is virtually free of any stresses.

Results

Since the liner is fully bonded with no adhesives or annular space between the liner and the metal substrate, chemicals cannot seep behind the ETFE liner, reducing the risk of corrosion. Therefore, the company is able to process more material at one time, improving operational efficiency.

For this application, rotationally-lining ETFE in these vessels costs about 40% more than sheet-lining per vessel. However, since the ETFE liners last 4 to 8 times longer than the sheet-lined PTFE on average, the roto-lined ETFE saves the company in the long run. For example, the ETFE liners have increased the service life to last 2-3 years on average. With a longer lifetime, there is an increase in plant uptime and reduction in the shipping and labor costs associated with replacing the liners.



Process

Regardless of size, it takes 1-2 months to line each vessel using the following process:

- 1 ● Engineers calculate the amount of ETFE resin that will be used.
- 2 ● The previous liner is removed from the vessel in the burnout oven.
- 3 ● The vessel gets sandblasted, which helps the team identify weld repairs that will be needed.
- 4 ● The welding team makes required structural repairs to the vessel.
- 5 ● The vessel is secured to the machine arm and then rotationally lined.
- 6 ● The ETFE on the flange faces is trimmed per customer specifications.
- 7 ● An ETFE sleeve sub-assembly is also welded to the inside of the vessel.
- 8 ● The outer surface of the vessel is prepped and painted per the customer's specifications.
- 9 ● Wooden end caps are added to the vessel and strap it to a cradle pallet.
- 10 ● Shipping is coordinated to send the vessel back to the mining facility

Chemical Plant Saves Money and Time Using New Lining Technology

Although most people instantly think of petroleum producers and refineries when they think of big Texas industries, chemical processing companies are also major contributors to the state's economy.

One such company has been a client of RMB Products since 2013. This chemical plant uses piping lined with PTFE (a synthetic fluoropolymer) to provide ethylene dichloride and vinyl chloride monomer chemical service to its equipment. Lining the pipe helps to prevent corrosion from ruining the piping.

In 2013, this company needed a 16' x 12' tee pipe lined within a short amount of time. Because there is a long lead time to line with PTFE in large diameter piping, the manufacturer's representative suggested lining the pipe with ETFE (a fluorine-based plastic), provided by RMB Products. The team at RMB used a process called rotational lining, which equally distributes an ETFE resin throughout the inside of the pipe. RMB was able to deliver the lined pipe to the chemical company in 2 weeks, which was well within the time constraints.

Challenge

During an inspection in 2017, the company discovered 90 pieces of piping lined with PTFE were beginning to blister and needed to be replaced. When a liner fails, the harsh chemicals running through the pipe can begin to corrode the steel itself, causing chemicals to leak out of the pipe.

The engineers planned to replace the pipe during the next two-week plant outage, which required meeting a tough schedule of 10 weeks for the replacements. If there was a delay in installation during that window of time, the chemical plant could lose hundreds of thousands of dollars for every day that it was shut down.

Working through the manufacturer's representative, the engineers from the chemical processing company set out to find a company to provide replacements for the 90 PTFE-lined pipes. The representative contacted PTFE lining companies, but no companies were able to deliver the product before the plant outage.

Solution

Remembering that the 5-year old ETFE-lined piping looked brand new during the inspection, the engineers also requested a quote from RMB Products for the 90 pieces. The RMB sales team responded with an estimate for ETFE-lined rotationally-lined pipe that guaranteed that not only could they produce the ETFE-lined pipe and fittings on time, but that they would be less costly than manufacturing more PTFE-lined pipe.

Because ETFE was not listed in the specifications for the piping, there was additional work that had to be done before the chemical company could sign off on purchasing the pipe lining from RMB Products. With help from the chemical plant engineers, the sales team at RMB worked diligently to provide detailed information about the process and the product. This information was presented to the plant managers and they agreed to purchase ETFE-lined piping from RMB Products.

Results

The engineers and chemical plant managers were very satisfied with the entire process, and were happy that they could install the new pipe during the scheduled plant outage. All said and done, the RMB Products team was able to deliver the ETFE-lined pipe on time and with a \$100,000 savings compared to PTFE-lined pipe. Rotationally lined ETFE is more cost effective than PTFE liner in this application due to the process differences, production flexibility, and materials available on-site.

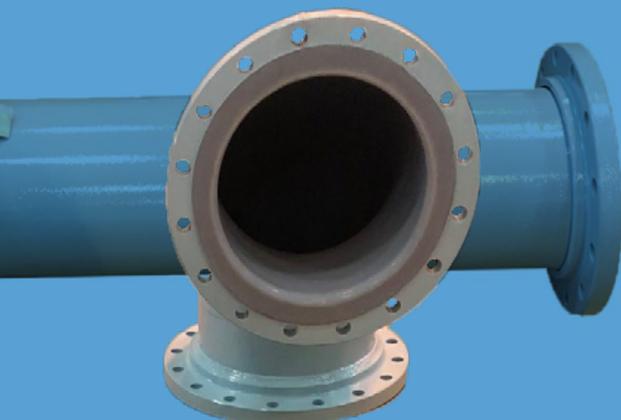
In RMB's rotational lining process, a pipe is rotated in an oven, allowing gravity to spread a layer of molten ETFE polymer on all internal surfaces. This creates a seamless lining that fully bonds to the metal substrate and is virtually free of any stresses. Since no adhesive is used in the process, chemicals cannot seep behind the ETFE liner, reducing the risk of pipe corrosion.

RMB specializes in custom solutions for customers and has the production line flexibility to handle large projects. For this reason, and because the ETFE resin is available on-site, RMB can offer a short lead time to manufacture ETFE liner.

Process

The entire process from start to finish took 10 weeks to complete. Below are the steps RMB used to rotationally line the 90 pieces of pipe.

- 1 The RMB engineering team created a material takeoff from the isometric drawings provided by the customer.
- 2 The RMB engineering team designed CAD drawings for each individual piece of pipe.
- 3 RMB procured steel from an external vendor and the RMB welding team fabricated the pieces of pipe together.
- 4 Each piece of pipe was roto-lined in an oven, which spread a layer of molten ETFE polymer on all internal surfaces.
- 5 The pipes were externally coated with the customer-specified 3-part paint system inside RMB's paint booth.
- 6 The pipes were packaged and shipped to the worksite on time.



Advantages

- Fluorine-based plastic
- High melting temperature
- High corrosion resistance
- Chemical, electrical, and high-energy radiation resistance properties
- Rated up to 300°F

ETFE Rotationally Lined Pipe Delivers Long-Term Corrosion Protection in Copper Mine's Concentrated Acid Operations

Arizona is America's top copper-producing state, and Tucson-headquartered ASARCO's integrated copper mining, smelting and refining operations produce 350 to 400 million pounds of copper annually. One of the company's sites east of Phoenix consists of side-by-side concentrator and heap leach operations. In the latter part of the 1990s, ASARCO contacted RMB Products for help in solving corrosion problems that occurred in transporting and mixing concentrated sulfuric acid for ASARCO's concentrator operation.

Challenge

Reducing corrosion in piping systems that handle concentrated sulfuric acid traditionally has been a challenge for copper mining companies. In sulfuric acid injection systems, localized high temperatures occur at the locations where 94% to 98% concentrated sulfuric acid is injected into a diluted acid stream. Downstream from the injection point, the acid is mixed inline and releases heat, resulting in temperatures as high as 300°F. The combination of high temperatures and acidic conditions creates a highly corrosive environment.

Corrosion also can create significant problems in piping near the intake and discharge nozzles of acid pumps. ASARCO uses carbon steel pipe to transport sulfuric acid at low velocity over long distances. But at pump stations, the flow velocity in the pipe in the immediate vicinity of the pump's intake and discharge nozzles (which typically have smaller inner diameters than the connecting pipe) increases rapidly, producing extremely corrosive conditions due to turbulent flow resulting from the increased velocity.

Many companies that handle concentrated sulfuric acid combat corrosion in these problem areas through the use of high-silicon ductile iron pipe or PTFE lined pipe, but neither solution is ideal. Ductile iron pipe imposes flow velocity limitations and is brittle. Because of the rugged conditions encountered in mining operations, ductile iron pipe is vulnerable to breaking, leading to dangerous and costly chemical spills.

ASARCO considered using PTFE lined pipe, but that solution would require frequent re-torquing of the pipe. By comparison, ethylene tetrafluoroethylene (ETFE) lined pipe does not require constant re-torquing. Using PTFE instead of ETFE lined pipe would increase the company's maintenance costs and the risk of leaking pipes and sulfuric acid spills.

Solution

RMB Products began providing custom-manufactured ETFE rotationally lined pipe to ASARCO in 1997.

Rotational lining with ETFE produces pipe with superior resistance to chemical corrosion and excellent strength over a wide temperature range up to 300°F.

RMB Products lines Schedule 120 carbon steel pipe with a thick layer of high-strength Chemours ETFE so that the inner diameter of the lined pipe exactly matches the inner diameter of the unlined Schedule 160 pipe that it connects to at ASARCO's plant. RMB Products specially manufactures the lined pipe with square corners at all flanges. This combination of square corners and matching inner pipe diameters results in the least amount of turbulence at any connection—eliminating a primary cause of corrosion and excess wear in sulfuric acid pipelines.

Because RMB Products offers a full range of vertically integrated manufacturing services at its Fountain,

Colorado, facility, the company provides ASARCO with a complete turnkey manufacturing solution. All engineering and design, fabrication, lining and painting are completed in-house, saving ASARCO lead time and the added expense of shipping the pipe from manufacturer to manufacturer to complete the project.

Providing all services in house also enables RMB Products to carefully control product quality:

- Use of Chemours ETFE exceeds all of ASARCO's service requirements
- The external coating applied to the piping protects it from ASARCO's harsh mining environment
- ETFE lined pipe provides ASARCO with a maintenance-free solution
- The ETFE lined carbon steel pipe is not brittle and will bend rather than shatter under stress

Results

ASARCO has not experienced a single failure of any ETFE lined pipe from RMB Products throughout 18 years of service; none of the lined pipe has required replacement. Over time, the mine has expanded its use of ETFE lined pipe. ASARCO has replaced existing piping throughout different areas of its operations with ETFE lined pipe from RMB Products because of the pipe's proven long service life and the repeated failures of other piping technologies.

Looking ahead, ASARCO is considering switching all of its concentrated acid piping to ETFE lined pipe—including the long, straight sections of carbon steel pipe used for transporting the sulfuric acid at low velocity over long distances. Making such a move would enable ASARCO to pump the concentrated acid at higher velocities without having to worry about corrosion.



RMB Products' ETFE Rotationally Lined Process Drum Solves Global Chemical Producer's Bromine Corrosion Problem

Bromine is used in the manufacture of a wide variety of consumer and industrial products including pharmaceuticals, flame retardants, water treatment chemicals, insect repellents, photographic chemicals, perfumes, dyes, oilfield completion fluids and other chemicals. In 2005, one of the world's leading suppliers of bromine and bromine-based products contacted RMB Products, looking for a better way to combat the destructive effects of corrosion in its bromine processing equipment.

Challenge

Bromine is less reactive than chlorine, more reactive than iodine and reacts vigorously with metals—especially in the presence of water—to produce corrosive bromide salts. Bromine is also reactive with most organic compounds, bonds easily with many elements and has a strong bleaching action. The element is highly soluble in organic solvents such as carbon disulfide, carbon tetrachloride, aliphatic alcohols and acetic acid.

Some of the chemical producer's processing drums—specifically those used for handling toxic and highly corrosive condensed bromine—needed to be upgraded to eliminate corrosion, extend the service life of the equipment and improve the company's return on its capital investment.



Solution

Rotational lining with a plastic polymer is well-suited to lining simple or complex metal structures, including vessels with diameter changes, multiple outlets, nozzles or other unique requirements. RMB Products worked with the chemical company's plant engineers and operators to analyze part geometries and determine the most appropriate design, lining strategy and material selection to deliver the bromine-drum service life the plant required.

The best solution for the bromine corrosion problem required the construction of an ASME vessel lined with the fluorine-based plastic ethylene tetrafluoroethylene (ETFE). ETFE provides high resistance to chemical corrosion and excellent strength over a wide temperature range. Although the operating temperature of the bromine drum would be 50°F to 100°F, for safety reasons the design temperature of the drum needed to be 300°F. Rugged ETFE met all the requirements.

In March 2005, the chemical company contracted with RMB Products to fabricate, test, line, assemble and paint an ETFE rotationally lined carbon steel drum (48" diameter × 60" length) with ANSI standard flanges. The plant required delivery of the drum within a short three months, by the end of June 2005.

RMB Products constructed the vessel to meet ASME Boiler and Pressure Vessel Code Section VIII, Division 1 standards. The vessel was RT-1 X-rayed, hydrotested at 130psig, and spark-tested at 18,000 volts DC in accordance with NACE standard RP0274. All stages of the project were completed at RMB Products' manufacturing facility in Fountain, CO.

Results

RMB Products custom-designed and manufactured the drum specifically for extended use with condensed bromine and delivered the drum to the plant in mid-June 2005—two weeks in advance of the company's deadline. RMB Products' ETFE liner has been tested and can withstand vacuum. The customer was confident the new liner would not collapse—even at full vacuum—as other types of liners can do. RMB Products' fully bonded ETFE lining was 3/16" thick, greatly exceeding the liner thickness produced from powder coating (a few thousandths on an inch) and sheet lining (about half the thickness of the ETFE liner). The chemical plant has kept the vessel in service since June 2005 without experiencing any performance problems requiring it to be taken out of service for repairs or relining.

Citing exceptional product performance, cost reduction and on-time delivery, the chemical company expressed a high level of customer satisfaction partnering with RMB Products on the condensed-bromine drum solution. The project is indicative of what RMB Products does best for companies of all sizes throughout the chemical processing industry: Provide a complete turnkey solution to solve a difficult corrosion problem, both economically and within a short lead time.

Shell Cuts Mars B Costs with RMB Products' Corrosion-Resistant Rotational Lining Solution

The Mars oil and gas field is located in the Gulf of Mexico about 130 miles southeast of New Orleans and has been one of Shell's most important fields over the past 15 years. Shell initially developed the field using the Mars A 24-well tension leg platform. Given the field's sizeable resources, the company assessed the need for additional infrastructure to boost production at the field. The resulting Mars B project adds new infrastructure to the Mars field and will extend its production life to at least 2050.

Challenge

The Mars B infrastructure includes an Olympus tension leg platform, with 24 well slots and a self-contained drilling rig. This production platform has 16 caissons installed in the tension legs to assist with stabilizing the platform by controlling and distributing sea water. Because offshore platforms are highly susceptible to the aggressively corrosive effects of seawater, Shell was determined to use corrosion resistant materials whenever possible.

Shell invited RMB Products to participate in the Shell Oil Deepwater Caisson Project in 2008. Shell's main objective was to find a corrosion-resistant replacement for the super duplex 2507 stainless steel caissons the company used previously. Shell needed fast production turnaround and required the alternative components to demonstrate equivalent or superior long-term performance. Finally, Shell stipulated that production costs had to meet—or beat—the budgeted cost targets.

Solution

RMB Products consulted with Shell for more than two years during the design phase of engineering. The scope of the project included:

- Design and engineering
- Custom material formulation and compounding (high-density polyethylene—HDPE—with added antimicrobial agent)
- Testing and validation
- Fabrication
- Preparation of the host structure
- Rotational lining with complex geometry
- Finishing, painting and delivery for inspection and acceptance

RMB Products provided in-house services throughout all phases of the project and delivered product in about one-third of the time required for stainless steel components.

Results

All aspects of the project ran smoothly and all project requirements were successfully met.

Project Turnaround

RMB Products delivered product 18 weeks after Shell released the order for production, compared with the anticipated 50-week lead time for super duplex stainless steel. Both lead times included fabrication, preparation, finishing, painting and delivery for inspection and acceptance.

Product Performance

- RMB Products used standard and proprietary preparation processes to enhance the receiving surface of the host material and better condition it for a successful coating application.
- RMB Products determined the manufacturing methodology to assure uniform wall thickness throughout the interior of the host structure. The complex shape varied in diameter, included multiple outlets and contained an internal component that transversed the interior of the caisson with four interlocking steel rectangular ribs.
- RMB Products and Shell collaborated to select high-density polyethylene (HDPE) for the lining material. Shell requested the addition of an antimicrobial element, requiring RMB Products to test modified batches of material until it achieved design requirements without affecting established mechanical properties.



Cost Reduction

RMB Products satisfied Shell's budget requirements. The rotational lining technology saved Shell \$5 million on the caisson portion of the Mars B project. Relative to the overall project costs approximating \$1 billion, the cost-savings contribution was a modest amount. However, meeting or exceeding all other project requirements while generating significant savings was a winning combination for Shell. As Mars B moves ahead, the use of corrosion-resistant HDPE will increase operational life, reducing maintenance costs and long-term capital expense for Shell.

Customer Satisfaction

The overall project went smoothly due to the ongoing successful collaboration of Shell and RMB Products. Shell engineers were highly satisfied with the value the alternative manufacturing materials and technologies provided for the project. Going forward, Shell has an additional arsenal of manufacturing options—with demonstrated advantages—that it can consider for future projects.

Texas Chemical Plant Validates Corrosion-Protection Performance of RMB Products' Rotationally Lined Fittings

Southeast Texas is home to numerous multinational chemical processing companies. One such company, well known for developing and manufacturing chemicals, plastics and agricultural products, went looking for long-lasting corrosion protection for its buried industrial pipes and fittings and turned to RMB Products. Fifteen years later, the company found RMB Products' rotationally lined components still had service life to spare. During the scheduled shutdown when the inspection was performed, the company chose to have RMB Products reline components, confident that the relined parts will deliver a minimum of 15 years of service life.

Challenge

Chemical production comprises continuous processes that are critically dependent on the quality of a plant's piping systems. The harsh environment created in chemical conveyance places high demands on pipes and fittings. Leaks resulting from a mechanical problem, cumulative wear or destructive corrosion can cause losses of millions of dollars annually when production must be shut down to correct the problem.

Chemical plants have always sought to increase equipment service life, extend the time between maintenance shutdowns and reduce the cost of equipment replacements. All components—vessels, pipe, fittings, valves, pumps and other equipment—must demonstrate they can withstand long-term exposure to the chemicals they come in contact with throughout the entire range of pressures, temperatures and other conditions they might encounter.

Such was the situation for the Southeast Texas plant in the late 1990s. The combination of piping system materials (unlined steel pipe and fittings), the slightly acidic brine handled and other factors required the plant to dig up and replace buried components every 7 years due to leaks in the system caused by corrosion.

The plant looked to replace its existing metal fittings with a solution that would improve corrosion protection, eliminate non-routine maintenance shutdowns and extend the service life of parts to reduce the frequency of scheduled shutdowns. The plant approached RMB Products for help. The company's demonstrated success using rotational lining with high-performance polymers for chemical processing applications provided the evidence the plant was looking for in a new solution.

Solution

Rotational lining is well-suited to lining simple or complex structures, including components with diameter changes, multiple outlets, nozzles or other unique requirements. RMB Products worked with plant engineers and operators to analyze part geometries and determine the most appropriate lining strategy and material selection to deliver the extended service life the plant was targeting.

Polyethylene is the most widely used plastic throughout the world. Compared with stainless steel and other alloys, the initial capital cost of polyethylene-lined fittings is lower, and the fittings last longer. In the 1990s, the material most used for rotational lining was cross-linked polyethylene (XLPE). Today, high-density polyethylene (HDPE) is the material of choice because of its superior bond to metal substrates and its lower cost.

Over the years, RMB Products rotationally lined hundreds of fittings at its Fountain, Colorado, manufacturing facility for use in this particular Southeast Texas plant, demonstrating the customer's confidence in RMB Products' lining system. The 21 XLPE-lined fittings targeted for inspection in 2012 included 10" diameter spool pieces and 45° and 90° elbows.

The plant had installed the fittings underground between 1997 and 1999, where they remained until December 2012. During a scheduled maintenance shutdown, the fittings were taken out of service and subsequently sent to RMB Products' Houston facility for inspection and testing.

Results

The customer reported no leaks or failures throughout the time the parts were in operation. At the Houston facility, RMB Products performed a series of tests and measurements on each of the fittings, including a visual inspection and spark test per the NACE SP0274 standard. Ultrasonic gauges were used to measure lining thickness during the inspection.

- Visual inspection. All liners were examined for cracks, gouges, nicks and abrasion. All fittings appeared to be in good shape: no missing fragments, exposed metal or scratches.
- Spark test. All liners were subjected to a high-voltage electrostatic test per the NACE SP0274 standard. Fourteen of the 21 fittings (67%) passed the spark test after 15 years of use.
- Lining thickness. The nominal lining thickness for the fittings was 0.320". At time of delivery, the minimum

allowable thickness was 66% of nominal (or 0.2112") per the RMB Products lining specification. During the inspection, the minimum thickness found was 0.221". Despite 15 years of use, the lining thickness of every fitting was within the minimum allowed at the time the lining was completed. Furthermore, 16 of the 21 fittings had minimum lining thickness readings above 0.250".

At completion of the round of testing and inspection, RMB Products estimated that the fittings exhibited 3 to 5 years of additional service life before needing to be replaced. Because the cost of shutting down service again in 3 to 5 years greatly outweighed the cost of relining the fittings, the customer chose to have RMB Products remove the XLPE liners and replace them with new HDPE liners, confident that the components could be placed back underground for another 15 years with no service issues. RMB Products completed the relining project within 4 weeks, well within the time allocated for the scheduled shutdown.

Conclusion

For decades, we have provided engineered solutions to solve our clients' most challenging problems.



Today, we specialize in custom manufacturing and engineered polymers for aerospace, corrosion protection, and high-purity applications. We use the processes of rotational molding, rotational lining, and additive manufacturing to create custom solutions for critical applications and those requiring tight specifications.

What Makes Us Different

Our proprietary resins and years of production process knowledge have positioned us to produce durable, high-quality thermoplastic parts for the aerospace industry, high-purity applications, and corrosion protection.

No project is the same, and we work with our clients to provide custom solutions for their specific needs and schedule. Clients gain additional value by utilizing our fabrication, machining, testing, assembly, painting, and shipping services. We routinely provide our linings and related services for capital projects as well as support for unexpected equipment downturns when an emergency response is needed.

How can RMB Help You?

Whether you are trying to minimize downtime because of a failed liner and need emergency services, need help to replace an asset during a future outage or are planning a new build, RMB can help. Simply reach out with your equipment type, service stream and dimensions and we'll help you determine what solution best fits your needs.

To get started, please contact Kira Kaleps by phone at 719-382-9300 ext. 1021 or by email at kkaleps@rmbproducts.com.