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The Society for Protective Coatings

FEATURES

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ALSO THIS ISSUE

STAFF

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In Memoriam: Monica Pierce

It is with overwhelming sadness and extremely heavy hearts that SSPC announces the passing of our dear friend and coworker Monica Pierce.

Monica joined the SSPC staff in 1990, working for the organization as the receptionist under then-executive director Bernie Appleman. Her fun-loving personality immediately endeared her to her colleagues, and SSPC knew they had a keeper.

Over the years, Monica rose through the organization in various roles, ultimately ending up as the accounts receivable specialist. Although her title changed, one constant was that she was always in a position where she worked directly with SSPC members. Her outgoing nature and easy rapport with people was where she really shined. Whether it was working the registration desk at the SSPC annual conference or talking to training instructors on the phone, Monica was the go-to figure who had the answer or could find it quickly.

Photo courtesy of SSPC.

She was the life of the party, the conversation-starter in the lunchroom and the chief happy-hour instigator. She was a welcoming face to new employees and a comforting confidante to those longtime staff who worked with her for years. She kept us laughing in the office, always ready with an offhand comment, practical joke or funny observation to keep us smiling.

The tremendous void that we fill with her loss is only tempered by the happy memories we have of her, and the stories we'll tell of "that time Monica did this ..."

Monica, from all your friends at SSPC: We miss you already. Rest in peace.

SSPC Publishes New Concrete Coating Texture Standard

SSPC: The Society for Protective Coatings recently published a new standard for measuring the texture of concrete coatings.

"Concrete Coating Texture Standard" (SSPC-CTS 1) establishes a classification system for textures of finish coats of applied concrete flooring systems. CTS 1 incudes a written standard for classification of concrete floor coating textures based on the height of the coating texture, and a companion set of plastic comparator coupons to be used as a tactile aid when determining the desired coating texture.

The coupons aim to serve as a supplement to the literature, and when the standard is used in conjunction with the comparators, it establishes a standard terminology that can be used by owners, specifiers and concrete flooring installers to describe various coating surface textures, SSPC said, noting that it is not intended to be used as a compliance verification tool.

Photo courtesy of SSPC.

The tactile texture comparator set represents different levels of texture of concrete floor coatings, according to SSPC. Smooth panels were used to prepare the samples, and the coupons can be used to assist in determining the degree of coating texture required for a flooring project, to assist in determining when an installed flooring system has excess wear and requires a surface texture refresh, and to provide the installation contractor with a tactile representation of the intended coating texture.

SSPC notes that customers are able to order the actual coupons from the SSPC Marketplace, and a copy of the printed standard will be shipped with the coupons. Members are also able to download copies of the PDF at no cost, but will have to purchase the coupons at a discounted rate.

SSPC-QP 1, PAINT 42 REVISIONS ISSUED

SSPC also announced the 2019 revisions of SSPC-QP 1, "Standard Procedure for Evaluating the Qualifications of Industrial/Marine Painting Contractors (Field Application to Complex Industrial Steel Structures and Other Metal Components)," and SSPC-Paint 42, "Epoxy Polyamide Coating, Performance-Based."

The QP 1 standard establishes minimum standards for a contractor's business practices, training of craft workers, quality control, environmental safety and health personnel, and subcontracting practices, according to SSPC. The standard is used by facility owners to prequalify contractors who perform surface preparation and coating application to complex industrial steel structures and metal components on location.

The 2019 revision of QP 1 clarifies the following.

- All subcontractors performing coating and surface preparation work must be certified to QP 1 if the project requires QP 1 certification.
- QP 1-certified contractors have always been required to comply with QP 1 program requirements whether or not QP 1 certification is required by contract. Therefore, a QP 1 contractor is responsible for ensuring that surface preparation and coating work performed by subcontractors also meets QP 1 requirements, even if the project does not require certification.
- The work of both the QP 1 contractor and subcontractors is subject to audit by the Qualifying Agency.

The other significant change in the 2019 QP 1 revision concerns requirements for the Environmental Health and Safety Manager. Specific training and education requirements have been clarified. The requirements for 40 contact hours of safety-related training and three years of industry experience have not changed.

Please note that the 2019 QP 1 revision requirements will not be implemented until the PCCP administrative program has been updated to reflect the revisions. QP audits in 2019 will continue to use the requirement of the 2012 version of QP 1, with editorial revisions of March 16, 2015, until further notice.

SSPC Paint 42 is a performance-based standard that can be specified for use in a single-coat application as a primer under a compatible topcoat or in multiple coats, according to SSPC. The revised Paint 42 expands the scope to allow multiple applications of the coating for increased barrier protection as a multi-coat epoxy polyamide system. The performance requirements in Paint 42 are intended to qualify a single-coat application.

The Paint 42 committee also agreed that polyamidoamine coatings should be removed from the scope of the standard because there is no performance test included in the document to test their wetting properties. If there is sufficient interest in a separate standard, SSPC will consider development of a performance standard for polyamidoamine coatings.

Other changes in the Paint 42 revision include the following:

- Section 5.3 Dry Film Thickness has added a required maximum DFT of 300 micrometers (~12 mils) for a single-coat application.
- Section 7.4 Flexibility requires use of a 1-inch conical mandrel according to the procedure in ASTM D 522 Method A, with a minimum elongation value of 3 percent.
- Table 1, Chemical Resistance minimum requirements are now "No softening" rather than "No change from benchmarked hardness value."
- Section 8.1 has changed the required accelerated test from humidity resistance in accordance with ASTM D1735 to condensation resistance in accordance with ASTM D4585.

Visit www.sspc.org to view these standards and others from SSPC.

Getty Images / Vertigo3d

PPG, Sherwin-Williams Post Q4, 2018 Financials

Global coatings suppliers PPG Industries and The Sherwin-Williams company each released fourth-quarter and year-end 2018 financial reports, with both companies reporting net sales increases compared to 2017.

In a Jan. 17 press release, PPG announced a 2-percent increase in constant currencies in fourth-quarter net sales, compared with the same quarter from the prior year. Fiscal 2018 also yielded a 4-percent increase in net sales from continuing operations.

Net sales were reportedly roughly $3.6 billion, a 1 percent decrease from the prior year, and net sales in constant currencies grew about 2 percent year-over-year, which was largely attributed to higher selling prices of more than 2 percent. Sales volumes were down by 1 percent, and foreign currency translation impacted net sales by $110 million, or 3 percent. Sales related to acquisitions, net of divestitures, contributed less than 1 percent to sales growth.

For the fourth quarter, reported net income from continuing operations was $256 million, up from 2017's fourth-quarter $148 million, with adjusted net income for the same business segment totaling $271 million.

Fourth-quarter sales for PPG's Performance Coatings segment totaled $2.1 billion, up $16 million, or nearly 1 percent, from 2017. Sales in constant currencies also saw a 3-percent increase, which was attributed to higher selling prices. Acquisition-related sales totaled roughly $15 million, which includes acquiring automotive refinish products manufacturer SEM. Volumes for the segment were flat, including the customer assortment changes in the national retail do-it-yourself channel, which cut down segment sales by roughly two percent. Foreign currency translation cut net sales by about 3 percent, or $55 million.

Compared to the prior year's performance in the same quarter, net sales for PPG's Industrial Coatings segment were about $1.5 billion, down $53 million, or more than 3 percent. Lower sales volumes were offset by higher selling prices of roughly 2 percent. Foreign currency translation decreased sales by about $55 million, or more than 3 percent, in comparison with 2017's fourth quarter.

According to PPG, reported net sales from continuing operations were approximately $15.4 billion, up about 4 percent from 2017, which includes foreign currency translation of less than 1 percent, or approximately $105 million. Organic sales growth saw a 3-percent increase, while acquisition-related sales clocked in a nearly 1-percent increase.

"As we look ahead, while we remain confident we are well-positioned strategically and financially, we enter 2019 with more global economic uncertainty," said Michael McGarry, PPG's chairman and CEO.

The Sherwin-Williams Company released its 2018 year-end and fourth-quarter financial results on Jan. 31, boasting record consolidated net sales at $17.53 billion.

Last year's record sales were reported at $14.98 billion and were largely owed to the June 2017 acquisition of Valspar. The company notes, though, that part of the 17-percent increase is still due primarily to incremental Valspar sales.

Consolidated net sales for the fourth quarter increased 2.1 percent to $4.06 billion, which Sherwin attributes to higher sales volume in the Americas group.

"Sherwin-Williams delivered record results in 2018 despite a fourth quarter that was below our expectations," said John G. Morikis, chairman, president and CEO.

Net sales in the Americas Group increased 5.8 percent to $9.63 billion year-over-year and increased 3 percent to $2.25 billion in the quarter compared to last year. Sherwin attributes this to higher architectural paint sales volume and selling-price increases. Sherwin's Performance Coatings Group saw the biggest net sales jump, with a 38.4-percent increase to $5.17 billion in the year, which is also attributed to the Valspar sales and selling price increases. Net sales in the quarter increased 4.8 percent to $1.27 billion. Segment profit increased in the year as well to $452.1 million from $262.8 million.

Morikis added that he anticipates a 2-to-6-percent net sales increase for the first quarter of 2019, as well as a 4-to-7-percent net sales increase over the course of 2019.

Problem Solving Forum

paintsquare.com/psf

How do you prepare flame-cut edges for application of thermal spray metallic coatings? The problem is that these edges are often harder than the abrasive, so a very low profile is produced, resulting in lower-than-specified adhesion of the thermal spray to the steel.

Grant Blohm, Metolizing Pro Inc.:
"Due to the heat generated in the flame-cutting process, steel along the cut edge is physically changed as a result. This outer layer near the cut is known as the heat-affected zone (HAZ), which is heated to a temperature in excess of 2,600 F and then rapidly cooled afterwards. The heat radiates into the rest of the plate. This narrow zone along the outer edge is then hardened by the process. To remove the hardened surface of the HAZ, it is necessary to physically grind the steel to a depth that will effectively anneal the HAZ, thereby allowing for conventional grit blasting to profile the steel. The depth of the HAZ will vary with the carbon level of the grade steel and the thickness of the plate. Thicker pieces or higher-strength steels require more stock removal. While grinding is slow and labor-intensive, it is the most common method to correct this condition. In a few instances where the HAZ depth is minimal, abrasive blasting with aluminum oxide has been able to profile the flame-cut edges to an acceptable degree. Generally speaking, grinding is still the most effective method in most cases."

Bryant Chandler, Greenman-Pedersen, Inc.:
"Carbon steel above about 0.3 percent carbon content will develop a hard surface (martensite) along the flame-cut edge. As the carbon content increases, the hardness (Rc) will increase during normal oxy-acetylene cutting processes. Abrasive wheel-grinding along the flame-cut edge to a depth of 1/32-inch to 1/16-inch should

PAINT POLL

paintsquare.com/pp1, Dec. 10 to 14, 2018

The former site of a Massachusetts coal-and-oil plant was recently converted to a solar farm. Do you think this kind of conversion will become more commonplace as the demand for renewable energy continues to increase?

Yes.	73%
No.	27%

Getty Images / republica

Lou Lyras:
"Continuing on our current path of digging, drilling, mining, using far more fossil fuels and disregarding the consequences is no longer an option. The solution is to build modern, state-of-the-art nuclear power plants ... New ones can be built (albeit with changes in regulations) and they would be cleanest source of energy that we have with the smallest environmental footprint ... While solar and wind have their place in the energy scheme, we cannot wait any longer for these sources to become our base energy loads. Building nuclear power plants will give us time to develop wind and solar where they can be used."

Scott Sammons:
"The main reason more similar sites will happen is due to the existing infrastructure surrounding such sites, [such as] transmission lines. I hope to see more low-efficiency, high-mass battery storage research, having many-ton saltwater or related batteries located throughout the grid to assist. Managing usage spikes will be key to sustainable energy development."

remove the hardened edge sufficient to obtain a good abrasive blasted profile. Grinding the edge is faster than trying to blast a profile by eroding away the hardened surface."

Brad Wilder, Intech Contracting:
"The AASHTO/NSBA Steel Bridge Fabrication Guide Specification lists three possible solutions: grinding, machining or heating. As the others have said, grinding is usually the most practical option in a field setting on an existing structure. Recent revisions to the AASHTO/NSBA guide highlight another important point: the cutting process can also leave striations or marks that can interfere with the use of replica tape. Inspectors should be aware of this and take care to confirm that edge profile measurements are actually measuring profile and not fabrication marks. For new structures that are to be thermal sprayed (or galvanized), it is worth considering non-thermal cutting methods to eliminate the issue prior to the coating process.

Jon Cavallo, Sponge-Jet Inc.:
"I agree with Chandler that the flame-cut edge is harder than essentially all of the standard blast abrasives and power tools and, as such, a minimum of 1/16-inch of the flame-cut edge must be removed to facilitate specified surface preparation. During my career, I have observed several significant coating failures caused by the flame-cut edge phenomenon and attendant inadequate surface profile."

PAINTSQUARE NEWS TOP 10

paintsquare.com/news, Jan. 7–Feb. 3

1. **Border Wall Prototypes Damaged with Tools**
2. **Sherwin-Williams Releases Q4, 2018 Numbers**
3. **OH Natural Gas Pipeline Explodes**
4. **RPM Releases Q2, Mid-Year Numbers**
5. **Longest Over-Water Bridge Almost Finished**
6. **Historic Detroit Bridge Collapses, None Injured**
7. **Researchers Eye Self-Healing in Corrosion Coating**
8. **PPG Reports Sales Growth in Q4, 2018**
9. **MA Coal Plant Converted to Solar Farm**
10. **Hiring Goals, Progress Made on $1.8B Vegas Stadium**

35 YEARS OF JPCL

THIS MONTH IN ...

CELEBRATING 1984 35 2019 YEARS

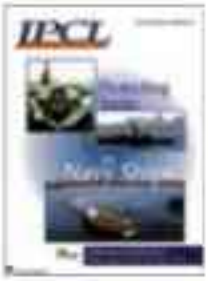
1989

The late coatings industry stalwart Clive Hare, who passed away July 14 of last year, authored "Barrier Coatings," a comprehensive article explaining the basic corrosion protection mechanisms behind barrier coatings, including chemical composition, performance capabilities and multi-coat systems for industrial applications.

1994

After OSHA's Lead in Construction Standard went into effect in 1993, the coatings industry responded with efforts to keep workers safe from exposure. Industrial hygienist Timothy Duffy and professional engineer John Cignatta penned, "Monitoring Breathing Air During Lead Painting Projects," which outlined air sampling data collection methods and clarified misperceptions about blast-cleaning existing lead-based paint.

2001



Novel marine coatings technology and quality assurance practices were the topic of an article by U.S. Navy researchers E. Dail Thomas and Arthur Webb. "The U.S. Navy's Advances in Coating Ship Tanks," summarized the results of a five-year Navy program to improve its materials and practices for preserving tanks onboard its ships.

2012

Dr. Mike O'Donoghue and Vijay Datta, along with a slew of co-authors, published the first in a series of award-winning technical investigations into the efficacy of protective coatings combatting corrosion under insulation. The authors' research in the subject, among others, is ongoing and will continue to be featured in ***JPCL***.

Visit www.paintsquare.com/archive to read more.

Too Deep or Too Shallow: Can Surface Profiles Be Changed by Additional Blast Cleaning?

BY WILLIAM CORBETT, PCS, AND CARLY MCGEE, PCS, KTA-TATOR, INC.

Imparting a surface profile, or creating a series of peaks and valleys, in a steel surface effectively increases the surface area and enhances the mechanical adhesion of coatings, as well as helps resist undercutting corrosion when the coating systems becomes damaged while in service. The measurement of surface profile depth is a frequent "hold-point" inspection when abrasive blast-cleaning is specified, and conformance to the specified surface profile range is a common contract requirement.

Coating specifications for protection of steel surfaces commonly contain requirements to generate a surface profile within a range (minimum and maximum depth). In the future, specifications may also invoke a requirement to achieve a minimum peak density or peak count. In either case, the resulting profile or anchor pattern is quantified or semi-quantified according to one of the three methods described in ASTM D4417[1], and peak count is quantified according to the method described in ASTM D7127[2]. The frequency and acceptability of the acquired measurements is described in SSPC-PA 17[3].

There are several factors that influence surface profile depth, including (but not limited to) nozzle-to-workpiece distance and angle; compressed air volume and pressure; abrasive type, size and hardness; substrate type and hardness; and the presence of a preexisting profile. Due to the number of variables, the profile that is achieved once the work begins may be different than the profile that is expected or specified. The preparation of a test area on the structure using the actual equipment, pressures and abrasive, all under representative site conditions, can aid in perfecting the cleaning process and selecting the proper abrasive size and type before the production work begins.

Selection of an abrasive that is too small or too large that results in an insufficient or excessive surface profile depth, or removal of an existing coating system that reveals an existing surface profile that exceeds the specification can result in specification deviations, non-conformities and project delays. Assuring proper surface preparation and profiling is one of the most effective ways to ensure a coatings failure is avoided.

Some evidence suggests that in order to deepen a surface profile that is too shallow, one should re-blast the surface with a larger abrasive. While this should work theoretically, it presents its own set of challenges. Since the surface is already "cleaned" and re-profiling typically doesn't change the visual appearance of the steel, it can be difficult for the blaster to make certain that every square inch of the surface is cleaned with the larger abrasive. Not only is it difficult for the blaster, but it's equally difficult for inspection to confirm that 100 percent of the surface has been addressed.

But what happens when the existing profile underneath the coating already exceeds the specified maximum, the steel is softer than anticipated, or the abrasive that is selected is too large to generate a surface profile within the specified range? Is it possible to reduce the profile? Some would suggest that re-blast cleaning parallel to the surface effectively reduces surface profile depth. Others believe that the peaks are simply being "rolled-over," and while the profile is within range, the density of the peak pattern has been reduced, lessening surface area and potentially causing a reduction in adhesion, or a lower resistance to corrosion undercutting when the coating system is damaged in service. And because re-profiling typically doesn't change the appearance of the steel, once again, consistency and thorough inspection become challenging.

A laboratory research initiative was undertaken to address these questions. The study involved preparing steel panels with large and small abrasives (to produce surface profiles that are both deep and shallow); re-preparing the surfaces using smaller/larger abrasives in an attempt to change the surface profile depths; characterizing the surfaces according to ASTM D4417 Methods B and C; obtaining peak density measurements using special "optical" replica tape and a replica tape reader; and assessing the relative peak count (defined as the number of peak/valley pairs, per unit of length, extending outside a "deadband" centered on the mean line) described in ASTM D7127. The change in the shape of the surface profile was also examined and images obtained using 3-D microscopy.

EXPERIMENTAL DESIGN

The purpose of the laboratory experiment was to investigate whether the surface profile produced by abrasive-blast-cleaning using an angular ferrous abrasive (steel grit) and a mineral abrasive (garnet) can be "altered," and whether attempts to increase or decrease surface profile depth have an adverse effect on other surface roughness characteristics.

One set of six large carbon steel plates bearing mill scale (each composed of four 12-inch-by-12-inch quadrants) were blast-cleaned with different abrasives. Three plates were prepared using garnet and three plates were prepared using steel grit to generate a nominal 1-mil surface profile on the entire surface, with the exception of Quadrant 4, which was protected (masked) to preserve the original mill scale. After blast-cleaning, the masking was removed from Quadrant 4, and Quadrant 1 was protected by masking to preserve the 1-mil blast. The panels were re-blasted with larger abrasives (garnet and steel grit, respectively), and the resulting surface profile depth and peak density/peak count were measured. The profiles from the re-blasted surfaces were compared to the two "control areas" on each panel (Quadrant 4, which contained the original mill scale and only received the second blast, and Quadrant 1, where the nominal

Table 1: Effect of Re-Blasting Existing Shallow and Deep Surface Profile.

Plate No./ Abrasive	Quad 1	Quad 2	Quad 3	Quad 4	Re-Blast (larger[1])	Re-Blast (larger[2])	Re-Blast (smaller[1])	Re-Blast (smaller[2])
1, 2, 3 (mineral abrasive)	1-mil	1-mil	1-mil	MS	Quad 2-4			
4, 5, 6 (ferrous, angular abrasive)	1-mil	1-mil	1-mil	MS		Quad 2-4		
7, 8, 9 (mineral abrasive)	5-mil	5-mil	5-mil	MS			Quad 2-4	
10, 11, 12 (ferrous, angular abrasive)	5-mil	5-mil	5-mil	MS				Quad 2-4

MS: Mill Scale
1. Used a mineral abrasive to generate a nominal 2-3 mil surface profile
2. Used a ferrous, angular abrasive to generate a nominal 2-3 mil surface profile

Table 2: Effect of Parallel Re-Blasting of an Existing Deep Surface Profile.

Plate No.	Quad 1	Quad 2	Quad 3	Quad 4	Re-Blast (parallel ~30°)	Re-Blast (parallel ~30°)
13, 14, 15 (mineral abrasive)	5-mil	5-mil	5-mil	5-mil	Quad 1-2 only	
16, 17, 18 (ferrous, angular abrasive)	5-mil	5-mil	5-mil	5-mil		Quad 1-2 only

Consequences of Insufficient Surface Profile Depth

Surface profile "anchors" the coating system to the substrate. As both the substrate and the coating system expand and contract, the coating system remains attached. Too-shallow surface profile can result in poor coating adhesion that often reveals itself once the bond of the coating system (to the substrate) undergoes stress. Many factors beyond abrasive size influence profile depth, including actual project conditions and relative hardness of the substrate.

CONSEQUENCES OF EXCESSIVE SURFACE PROFILE DEPTH

Excessive surface profile can result in pinpoint rusting from rogue peaks protruding above the coating as it progresses from wet to dry. While many will argue that an extra coat (or thicker application) will eliminate this issue, it only kicks the proverbial can down the road to the next contractor who removes the deteriorated coating, only to reveal a profile that already exceeds the specification – becoming their issue to manage. Also, the additional coating thickness may reduce the number of times the existing system can be successfully overcoated.

TRY IT BEFORE YOU BUY IT

Increasing or decreasing surface profile after a surface is already prepared is difficult for the worker, who cannot visually assess whether he or she is re-blasting the surface consistently, and results in significant additional quality checks (abrasive cleanliness, compressed air cleanliness, surface profile and cleanliness, surface dust), not to mention labor and material costs and schedule delays. Preparation of a small test area prior to production blast-cleaning to verify proper surface profile generation can reveal a potential issue and eliminate considerable re-work.

1-mil profile was protected from the second blast-cleaning operation).

A second set of six hot-rolled, carbon steel plates bearing mill scale was prepared again with the same abrasives, to generate a target 5-mil surface profile (the actual profile with garnet was slightly lower and steel grit was higher). The same approach described above was followed for the quadrants. The plates containing the deep profile were re-blasted with two smaller abrasives (garnet and steel grit, respectively), and the resulting surface profile depth and peak density/peak count were measured and compared to the same two "control areas" described above that are created on each panel. Test variables for panels 1 to 12 are summarized in Table 1.

A third set of six panels was prepared to achieve a target 5-mil surface profile on the entire panel. Two of the quadrants of each panel were subsequently re-blasted with the same type and size abrasives, with the nozzle held parallel to the surface (approximately 30 degrees) to assess whether the surface profile could be effectively reduced by changing technique rather than abrasives (without a substantive reduction in peak density/peak count). Test variables for panels 13 to 18 are summarized in Table 2.

The methods used to characterize the abrasive blast-cleaned surfaces are described in ASTM D4417, Methods B and C (depth micrometer and replica tape, respectively). Peak density (Pd) measurements (peaks/mm^2) were also obtained using optical-grade replica tape and a replica tape reader, and the relative peak count (Rpc) described in ASTM D7127 was measured. The change in the shape of the surface profile was examined using 3-D microscopy and digital photomicrographs of the prepared surfaces were obtained.

RESULTS

Test Variable 1: A shallow surface profile (e.g., 1 mil) was produced using a mineral abrasive. Can it be increased using a larger mineral abrasive?

The initial abrasive blast-cleaning was performed using No. 80 garnet (Quadrants 1 through 3). Garnet 30/60 was used to blast-clean Quadrant 4 and re-blast Quadrants 2 and 3. Table 3 (p. 12) contains the averaged results of the measurements taken both before and after

Table 3: Summary Results of Test Variable No. 1.

Technique	Attributes of Initial Abrasive on Mill Scale (Quadrant 1)	Attributes of Second Abrasive on Mill Scale (Quadrant 4)	Attributes of Re-Blast (Quadrants 2, 3)
Depth Micrometer (ASTM D4417, B)	1.5 mils	2.2 mils	2.2 mils
Replica Tape (ASTM D4417, C)	2.0 mils	3.0 mils	2.9 mils
Peak Density (Pd) with Replica Tape	17/mm²	14/mm²	16/mm²
Peak Count (Rpc; ASTM D7127)	83/cm	67/cm	69/cm

Characteristic	Yes	No	% Change
Did the re-blast increase the surface profile?	X		+32% & +31%[2]
Did the re-blast change the peak density?	X		-6%
Did the re-blast change the peak count?	X		-17%

1. Depth Micrometer 2. Replica Tape

Fig. 1: (L-R) Initial roughness with smaller garnet abrasive (Quadrant 1) and roughness generated by re-blast with larger abrasive (Quadrant 2). Figures courtesy of KTA-Tator, Inc.

Fig. 2: (L-R) Initial roughness with smaller steel-grit abrasive (Quadrant 1) and roughness generated by re-blast with larger abrasive (Quadrant 2).

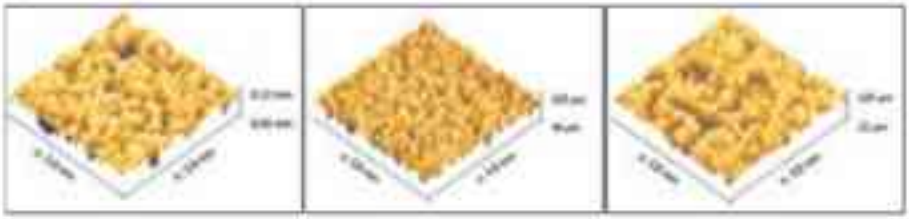


Fig. 3: (L-R) Initial peak density (Quadrant 1); peak density generated by second (garnet) abrasive on mill scale (Quadrant 4); and peak density generated by re-blast (Quadrant 3).

re-blasting.

The initial "shallow" surface profile was increased by re-blasting with a larger abrasive (of the same generic type, garnet) without using any special techniques. The re-blast resulted in a reduction of peak density and peak count, compared to the initial preparation. However, after cleaning the previously blast-cleaned surface with a larger abrasive, the characteristics became similar to the surface created by the larger abrasive on mill scale (Fig. 1).

Test Variable 2: A shallow surface profile (e.g., 1-mil) was produced using a ferrous, angular abrasive. Can it be increased using a larger ferrous, angular abrasive?

The initial abrasive blast-cleaning was performed using G120 steel grit (Quadrants 1 through 3). G80 steel grit was used to blast clean Quadrant 4 and re-blast Quadrants 2 and 3. Table 4 contains the averaged results of the measurements taken both before and after re-blasting.

Similar to Test Variable 1, the initial "shallow" surface profile increased by re-blasting with a larger abrasive (of the same generic type, steel grit) without using any special techniques. Again, the re-blast resulted in a reduction of peak density and peak count, compared to the initial preparation, and the characteristics became similar to the surface created by the larger abrasive on mill scale (Fig. 2).

Test Variable 3: A deep surface profile (e.g., 5-mil) was produced using a mineral abrasive. Can it be reduced using a smaller mineral abrasive (with the blast nozzle maintained 80- to-90 degrees to the surface)?

The initial abrasive blast-cleaning was performed using No. 16 garnet (Quadrants 1 through 3). Garnet 30/60 abrasive was used to blast-clean Quadrant 4 and to re-blast Quadrants 2 and 3. Table 5 (p. 14) contains the averaged results of the measurements taken both before and after re-blast.

The initial deep surface profile decreased by re-blasting with a smaller abrasive of the same generic type without using any special technique.

Fig. 4: (L-R) Initial roughness with larger garnet abrasive (Quadrant 1) and roughness generated by re-blast with smaller abrasive (Quadrant 2).

Table 4: Summary Results of Test Variable No. 2.

Technique	Attributes of Initial Abrasive on Mill Scale (Quadrant 1)	Attributes of Second Abrasive on Mill Scale (Quadrant 4)	Attributes of Re-Blast (Quadrants 2, 3)
Depth Micrometer (ASTM D4417, B)	1.8 mils	2.6 mils	2.5 mils
Replica Tape (ASTM D4417, C)	1.8 mils	2.7 mils	2.7 mils
Peak Density (Pd) with Replica Tape	20/mm²	13/mm²	12/mm²
Peak Count (Rpc; ASTM D7127)	116/cm	76/cm	77/cm

Characteristic	Yes	No	% Change
Did the re-blast increase the surface profile?	X		+28% & +33%[2]
Did the re-blast change the peak density?	X		-40%
Did the re-blast change the peak count?	X		-34%

1. Depth Micrometer 2. Replica Tape

Fig. 5: (L-R) Initial peak density (Quadrant 1); peak density generated by second (steel grit) abrasive on mill scale (Quadrant 4); and peak density generated by re-blast (Quadrant 3).

Fig. 6: (L-R) Initial roughness with larger steel grit abrasive (Quadrant 1) and roughness generated by re-blast with smaller abrasive (Quadrant 2).

However, the surface profile did not decrease to the depth created by the same (second) abrasive on mill scale. The re-blasted surface remained 0.7-to-1.0 mil higher. The re-blast resulted in a slight increase in peak density and peak count, compared to the initial preparation; however, the peak density and peak count were both comparatively lower than when the smaller abrasive was used on mill scale (Figs. 3 and 4).

Test Variable 4: A deep surface profile (e.g., >5-mils) was produced using a ferrous, angular abrasive. Can it be reduced using a smaller ferrous, angular abrasive (with the blast nozzle maintained 80-to-90 degrees to the surface)?

The initial abrasive blast-cleaning was performed using G18 steel grit (Quadrants 1 through 3). A G80 steel grit abrasive was used to blast clean Quadrant 4 and to re-blast Quadrants 2 and 3. Table 6 (p. 14) contains the averaged results of the measurements taken both before and after re-blast cleaning.

The initial deep surface profile decreased by re-blasting with a smaller abrasive of the same generic type without using any special technique. However, the surface profile did not decrease to the depth created by the same (second) abrasive on mill scale. The re-blasted surface remained 0.7-to-1.1 mil higher. The re-blast increased the peak density (slightly) and peak count, compared to the initial preparation, but the peak density and peak count were both comparatively lower than when the larger abrasive was used on mill scale (Figs. 5 and 6).

Test Variables 5 and 6: A deep surface profile (e.g., 5-mil) was produced using a mineral and ferrous angular abrasive. Can it be reduced using the same type and size abrasives when re-blasting is performed parallel (~30 degree angle) to the surface?

Table 5: Summary Results of Test Variable No. 3.

Technique	Attributes of Initial Abrasive on Mill Scale (Quadrant 1)	Attributes of Second Abrasive on Mill Scale (Quadrant 4)	Attributes of Re-Blast (Quadrants 2, 3)
Depth Micrometer (ASTM D4417; B)	4.6 mils	2.1 mils	2.8 mils
Replica Tape (ASTM D4417; C)	4.8 mils	2.9 mils	3.8 mils
Peak Density (Pd) with Replica Tape	6/mm²	17/mm²	7/mm²
Peak Count (Rpc; ASTM D7127)	49/cm	66/cm	57/cm

Characteristic	Yes	No	% Change
Did the re-blast decrease the surface profile?	X		-39%[1] & -21%[2]
Did the re-blast change the peak density?	X		+14%
Did the re-blast change the peak count?	X		+14%

1. Depth Micrometer 2. Replica Tape

Table 6: Summary Results of Test Variable No. 4.

Technique	Attributes of Initial Abrasive on Mill Scale (Quadrant 1)	Attributes of Second Abrasive on Mill Scale (Quadrant 4)	Attributes of Re-Blast (Quadrants 2, 3)
Depth Micrometer (ASTM D4417; B)	7.0 mils	2.4 mils	3.1 mils
Replica Tape (ASTM D4417; C)	5.9 mils	2.6 mils	3.7 mils
Peak Density (Pd) with Replica Tape	5/mm²	16/mm²	6/mm²
Peak Count (Rpc; ASTM D7127)	36/cm	77/cm	54/cm

Characteristic	Yes	No	% Change
Did the re-blast decrease the surface profile?	X		-56%[1] & -37%[2]
Did the re-blast change the peak density?	X		+17%
Did the re-blast change the peak count?	X		+33%

1. Depth Micrometer
2. Replica Tape

The initial deep surface profile could not be effectively reduced by re-blasting with the same abrasive (garnet or steel grit) while positioning the blast nozzle parallel to the surface. In fact, the re-blast resulted in an even deeper profile (garnet) or remained the same (steel grit) and caused slight reductions in peak density and peak count.

CONCLUSIONS

Based on these results, it appears that a shallow surface profile can be increased by re-blasting the surface with a larger abrasive. The larger abrasive created a new surface profile that was similar in depth to the profile achieved when the larger abrasive was used on mill scale. The fact that an initial shallower profile was present did not influence the newly created profile. The pre-existing shallow profile also did not have a significant impact on peak density or peak count compared to the larger abrasive used on mill scale.

The research indicates that a deep surface profile can be reduced by re-blasting with a smaller abrasive, as well. Based on the test variables, the reduction was from approximately 1.0 to >3.0 mils, but the profile was still deeper (approximately 0.7-to-1.1 mil) than when the smaller abrasive was used on mill scale. The re-blast resulted in a slight increase in peak density and peak count compared to the deeper profile, but peak density and peak count were both lower than when the smaller abrasive was used on mill scale.

Finally, it appears that it is ineffective to attempt to reduce surface profile depth by re-blasting the surface with the same size abrasive, but at an angle nearly parallel to the surface.

In order to help reduce or prevent excessive or insufficient surface profile generation, it is helpful to prepare a test section prior to production blast-cleaning. While some specifications directly invoke this requirement, many focus on creating a test section for surface cleanliness and do not explicitly address verifying conformance to minimum and maximum surface profile requirements (and minimum peak density/peak count requirements, if specified). This is especially beneficial when a preexisting surface profile is present, or the steel is badly pitted. It only takes a few hours at project start-up to verify conformance to surface profile requirements prior to blasting.

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IN EFFECT AND BEING ENFORCED:
HAZARDOUS WASTE GENERATOR IMPROVEMENT REGULATIONS

BY ALISON B. KAELIN, CQA, ABKAELIN, LLC

If you are a facility, asset or structure owner, or an industrial painting contractor, you probably have to deal with hazardous waste as a generator or a co-generator. You may have taken SSPC C3, C5 or other hazardous waste training and have developed specifications, internal training and programs to address hazardous waste management.

However, if you haven't reviewed and updated your documents or training in the last two years – and depending on where you are located – you are likely out of compliance with several requirements in the standard.

The hazardous waste generator improvement regulations (GIR) were enacted on November 28, 2016, and are fully in effect in Idaho, Utah, Colorado, Oklahoma, Mississippi, Alabama, Georgia, Florida, North Carolina, Iowa, Kentucky, Virginia, West Virginia, Pennsylvania and New Jersey. Rulemaking continues through 2019 in other states.

This regulation is also being actively enforced by several states that oversee compliance including the New Jersey and Pennsylvania Departments of Environmental Protection and the Virginia Department of Environmental Quality.

Having participated in a few audits in 2018 and having reviewed various EPA and state documents regarding the changes, the author offers the following insights on items being evaluated and enforced.

HAZARDOUS WASTE DETERMINATIONS

These must be accurate and confirm when and how the hazardous waste determination (HWD) was made.

"The hazardous waste determination for each solid waste must be made at the point of waste generation, before any dilution, mixing or other alteration of the waste occurs, and at any time in the course of its management that it has, or may have, changed its properties as a result of exposure to the environment or other factors that may change the properties of the waste such that the RCRA classification of the waste may change."

"Point of generation" is defined as when the waste first becomes a solid waste, i.e., will no longer be reused or recycled. In its training, the EPA notes that alteration of waste includes letting volatile organic solvents volatilize from an uncovered container, as is a common industrial painting practice.

To meet GIR, the generator must carry out the following in the order listed.

1. Evaluate whether or not the waste is excluded.
2. Use knowledge to determine if the waste is listed.
3. Determine if the waste exhibits one or more characteristics regardless of whether or not it is listed.

The generator must apply knowledge of the hazardous characteristics of the waste in light of the materials or the processes used to generate the waste and must still determine if the waste exhibits characteristics of toxicity for all hazardous metals that may be present in order to comply with the land disposal restrictions.

The EPA allows generators to over-classify and over-manage wastes. Generator knowledge may include declaring a waste

hazardous for the toxic characteristic of lead, without testing, as is often done with wastes resulting from the use of steel grit (due to the plating effect of the steel on lead). However, this practice may create a failure to determine if other underlying hazardous constituents are present.

RECORD KEEPING

Small- and large-quantity generators must maintain records of hazardous determinations that must include valid test results, explanations of the basis of the generator's determination and also requires retention for at least three years from the date of the last shipment of hazardous waste.

LAND DISPOSAL RESTRICTION

These restrictions apply to characteristic wastes ("D" waste code designation) such as lead, arsenic, cadmium and chromium. The treatment standards for most characteristic hazardous wastes entail rendering the waste nonhazardous (i.e., de-characterizing the waste or removing the characteristic). In addition to evaluating the waste as hazardous, generators must also evaluate it for underlying hazardous constituents (UHC). The UHC must then be treated to the universal treatment standards before disposal.

If you are a large-quantity generator (LQG) or a small-quantity generator (SQG), you must send a land disposal restriction (LDR) notification with the first shipment of waste. This notification is often referred to as a land ban form, which is used when waste contains any UHC (still requiring treatment before it can go into a landfill). It is completed based on the hazard determination and provided to the disposal facility.

Generators and those signing manifests should review and verify the hazard determination and LDR form along with the manifest prior to signature and shipment of waste. The New Jersey Department of Environmental Protection requests all of the aforementioned at their closure audits.

PREPAREDNESS, PREVENTION AND CONTINGENCY PLANS (PPCP)

GIR requires PPCP be developed and applied where hazardous waste is being generated or accumulated at the generator's site, including points of generation, satellite accumulation areas and central accumulation areas (90-day areas). This includes the containment system, recycling units and dust collectors, and satellite storage areas (for example, where disposable clothing is discarded when removed).

The PPCP plan must include the following information at minimum, and must be kept up-to-date.

1. A description of the arrangements made with local police, fire, emergency response or third-party contractors.
2. A list of the names and emergency telephone numbers of all personnel who can act as the emergency coordinator.
3. A list of all emergency equipment at the facility, including fire extinguishers, spill-control equipment and communications equipment. It must also include the location of each piece of equipment and an outline of its capabilities.
4. An evacuation plan for generator personnel, including signals used to begin the evacuation, routes and alternative routes.

It also requires a quick reference guide containing the following information.

1. The types and names of hazardous waste in layman's terms and the associated hazards (for example, toxic paint wastes and spent ignitable solvents).
2. The estimated maximum amount of each hazardous waste that may be present at any time.
3. The identification of any hazardous waste where exposure could require medical treatment.
4. A map of the facility showing where the hazardous wastes are generated and accumulated, and routes for access.
5. A street map of the facility and surrounding businesses, schools and residential areas.
6. The location of water supply and flow rate.
7. The identification of on-site notification systems.
8. The name of the full-time emergency coordinator and emergency contact number.

GIR requires that generators make arrangements with all state and local response teams that may be called upon to provide emergency services, as well as local emergency planning committees. Generators must document that they have attempted to make arrangements with local emergency responders (or that arrangements were sought but not obtained) and keep the documentation with the plan. Any plan revisions must be also be sent.

In the audits the author attended, participants were asked to provide their PPCP and quick reference guide as well as emails or mail receipts indicating that copies of the plan to affected emergency responders had been provided. In addition, they were encouraged to actively discuss the project and issues with the local emergency responders.

CONTAINERS, PACKAGING, LABELING AND RECORDS

Under the existing regulations, LQGs and SQGs must label their hazardous waste containers and tanks with the words "Hazardous Waste." Containers must also be marked with the accumulation start date and must bear additional markings prior to shipment off-site, including the name, address and EPA identification of the generator as well as the manifest tracking number.

GIR requires that labels also indicate the type of hazard in easy-to-understand terms. OSHA/GHS (Globally Harmonized System of Classification and Labeling of Chemicals) hazard pictograms or National Fire Protection Association (NFPA) diamonds can be used.

Containers used to hold disposable clothing after it has been removed by workers should be labeled as hazardous waste and described as above. Hazardous waste labels should be applied at the point of generation. Contrary to our prior practice of labeling waste as "potentially hazardous" or "testing pending," under the GIR the waste is to be managed as hazardous (i.e., labeled) and the labels removed only if testing proves that it is not hazardous.

Weekly inspections must be performed and documented at all locations where hazardous waste is generated or stored. Inventory logs tracking the amounts of hazardous waste generated, currently on-site, and the dates it was removed from the site (typically within 90 days) should be maintained on-site and readily available for inspection.

WASTE MINIMIZATION PROGRAM

One overlooked item that has been in place for years is now being enforced for LQGs — the requirement for a waste minimization program (40 CFR 262.27). A generator who initiates a shipment of hazardous waste certifies the following through signature on Item 15 of the hazardous waste manifest.

"I am a large-quantity generator. I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and I have selected the practicable method of treatment, storage or disposal currently available to me which minimizes the present and future threat to human health and the environment." SQGs must also make a good-faith effort.

The New Jersey Department of Environmental Protection requests that the contractor develop a waste-minimization program addressing all types of waste on the project, including surface-preparation waste, spent solvents and coatings, and solid and liquid wastes; and have the owner review and approve the plan.

PERSONNEL TRAINING

LQG personnel must complete classroom instruction, online training or on-the-job training that teaches them to perform their duties. The training must be provided by a person trained in hazardous waste management procedures. Training must include response to emergencies, emergency procedures, emergency equipment and emergency systems and include the following, where applicable:

1. Procedures for using, inspecting, repairing and replacing facility emergency and monitoring equipment.
2. Key parameters for automatic waste feed cut-off systems (for example, recycling units and dust collectors).
3. Communications or alarm systems.
4. Response to fires or explosions.
5. Response to groundwater contamination incidents.
6. Shutdown of operations.

Training must be provided before exposure and then annually. Training records must be maintained for each position, include a job description, include initial and annual training and be kept until closure or three years from the date that the employee last worked.

CLOSURE

When an LQG closes its entire facility (such as at the end of a field painting project), it must notify the EPA or state regulatory agency 30 days in advance and submit a second notification within 90 days after the facility closure stating that all of the relevant accumulation units (i.e., work areas, structure, satellite and secure storage areas and equipment locations) have been cleaned.

"Clean" means to remove and properly manage all "hazardous waste, hazardous constituents, leachate, contaminated runoff or hazardous waste decomposition products to the ground or surface waters or to the atmosphere" and decontaminate or properly remove and/or dispose of all contaminated equipment, structures and soils.

This a huge change in generator and co-generator waste management requirements, especially for field coating removal projects, and places new emphasis on post-project cleanup and formal closure of painting projects.

The New Jersey Department of Environmental Protection performed a final closure inspection at one site for visible steel grit and lead paint debris, oil drips and spills, sheen on water or on the ground, and paint waste.

It is wise to be sure that you are in compliance with the GIR before you get a visit from EPA or the state.

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Fig. 1: Many solar projects are located in arid, desert regions where the soil may present corrosive conditions for underground steel structures. Photo: Getty Images / Edward Lysenko

BY PAUL TRAUTMANN AND MATTHEW MARKOWSKI, THE SHERWIN-WILLIAMS COMPANY; AND BRIEN CLARK, JAMES KEEGAN AND MERSEDEH AKHOONDAN, HDR

CORROSIVE SOILS AND RISK MITIGATION FOR SOLAR STRUCTURES

Utility-scale solar array construction projects continue to grow in number annually. Large, open spaces with consistent UV exposure make excellent locations for solar array fields, but these sites do not always provide ideal soil conditions for the steel H-beam pile supports that are embedded into the ground. For example, many solar array projects are located in arid, desert regions or land historically used for agriculture, where the land often consists of disturbed soils, or soils that are naturally corrosive in nature.

Corrosion of these piles due to disturbed or corrosive soils is a concern for design engineers and owners. Protective measures must provide sufficient length of service to protect H-beams and ultimately prevent structural failure over the structure's designed service life. Photovoltaic (PV) solar equipment is designed for a 25-year service life, and the supporting infrastructure should be designed to maximize construction and installation investment costs.

Today's high-performance coatings can provide an excellent solution for protecting steel piles driven into corrosive soil conditions. This article will discuss the various corrosion mechanisms and inhibitors present in different soil conditions and the protective properties of different coatings types to meet the service life requirements for steel solar structures.

SOIL CONDITIONS

Many studies have been carried out to identify corrosive soil conditions and their effect on corrosion rates on steel embedded below-grade. These include the soil's physical characteristics, aeration within the soil, moisture content, chemical content, pH and the electrical resistivity of the soil, which all have an effect on how corrosive a particular soil is[1]. These conditions influence the corrosivity of soil in a complex relationship that requires multiple test procedures and qualified corrosion engineers to fully understand individual project conditions.

The physical characteristics of soils are broken down by particle size and by soil texture. The "Unified Soil Classification System," used by foundation engineers, classifies soil from "gravel" on one extreme to "clay" on the other end.

Moisture acts as the electrolyte of the corrosion cell, providing the conduit for electrons. Moisture content is recorded as a percentage based on the dry weight of the soil. Moisture content in soils may vary based on weather conditions and water table locations. High water tables may result in buried structures behaving as if they were immersed in a liquid environment. Water from rainfall will soak into the soil as determined by its permeability. Heavy rainfall may remove soluble salts that contribute to accelerated corrosion but in turn renders those soils acidic[2]. Desert areas where rainfall is irregular would have naturally high salt levels and will be more corrosive to buried metals when moistened. Dry lakes and salt sinks are usually hygroscopic in nature and will absorb any available moisture and continue to hold moisture for a prolonged period of time. Corrosion can become a problem in a short time when moisture content is 15 percent or more.

Aeration is a measure of available oxygen in the soil surrounding the metal support structure. Along with atmospheric oxygen, oxygen in soil comes from the wetting and drying process, which provides active oxygen content for accelerated corrosion effects at or near the surface. Highly aerated soils may provide high initial corrosion rates; however, poorly aerated soils will generally be found to be more corrosive. Poorly aerated soils have slower initial corrosion rates that continue at a relatively constant rate which tends to lead to failure earlier than with high aeration.

A driven pile travelling through clay and sand would encounter different aeration conditions, as the action of driving the piling into the ground will introduce oxygen into and disturb the surrounding soil above the water table. Aeration increases in disturbed soil conditions as oxygen is introduced into soil during construction or farming activity. Aeration can also increase in expansive or swelling soils, which contain a high percentage of clay particles. Clays can absorb large amounts of water and do not completely dry out after exposure to moisture, allowing for increased permeability of soils so that oxygen and moisture can penetrate deeper into the ground.

Electrical resistivity is the most common method to measure soil corrosivity, providing

a quantitative value on how quickly electrons can flow through the soil to complete the corrosion process. The lower the value, the more corrosive potential a soil has as its resistance to electrical current is weak. The resistivity of soil depends on its chemical content, moisture content and temperature.

The electrical resistivity of a soil will decrease as moisture content increases until the saturation point. Beyond the point of saturation, the resistivity of the water becomes the dominant factor. Pure (deionized) water has high resistivity to electrical current flow (less corrosive). However, the resistivity of the water is influenced and reduced (more corrosive) according to the amount of salts and chemicals absorbed into the water. Higher amounts of salts and chemicals will increase the corrosivity of water.

Soluble salts, namely chloride ions are generally detrimental because they decrease soil resistivity. The presence of salts in soil primarily occurs from agricultural activities, or is naturally occurring based on the region where the project is located. Different salts have different conductive properties and corrosivity will increase or decrease based the amount and type of salts present in the soil. A soil containing sodium chloride would have lower resistivity (more corrosive) than a soil containing an equal amount of sodium sulfate.

The measure of acidic or alkaline conditions, or pH, also has varying effects on corrosion rates of buried metals. Ferrous metal corrodes quickly in acidic environments, and slowly or not at all as alkalinity increases. Soils that are highly acidic (pH < 4.5) are considered highly corrosive for ferrous metal.

CORROSION RATES

Many of these conditions can interact to provide compounding degrees of corrosivity, such as high-moisture-content soils having higher acidity or dryer soils with high chloride content, both leading to higher corrosion rates. From the studies conducted, there is a consensus that the following soil conditions are considered aggressive or highly corrosive, and would require steel piles to be given additional protection[7]. The corrosion rates or loss of base metal is severe in these conditions.

- Resistivity: <500 Ωcm.
- pH: <4.5 or greater than 10.
- pH: 5.5 – 8.5 soils with high organic content.
- Sulfate concentration: >1,000 ppm.
- Chloride concentration: >500 ppm.

Mildly corrosive soil conditions, shown below, would also require additional corrosion protection, but the assumed corrosion rates of carbon and galvanized steel are low — 12µm/year (0.308 oz/ft^2) for carbon steel and 15µm/year (0.308 oz/ft^2) for zinc[8].

- Resistivity: >3,000 Ωcm.
- pH: >5 and <10.
- Sulfate concentration: 200 ppm.
- Chloride concentration: 100 ppm.
- Organic content: 1 percent maximum.

Project-specific corrosion rates can be determined by a qualified corrosion engineer assessing each of the mentioned conditions. One corrosive soils study demonstrated that corrosion of carbon steel in the aforementioned conditions will yield section loss of 2-to-3 ounces per square foot per year[9]. Other studies have shown that zinc in similar conditions will yield section loss of 1-to-2 ounces per square foot per year. In terms of mil thickness, the high range for steel metal loss is 6-to-7.87 mils per square foot per year and galvanized metal loss is 0.60-to-0.98 mils or more in corrosive soil conditions[8]. Section loss of 25 percent would be considered serious for a pile — a beam that lost 25 percent of its load bearing capacity would be considered structurally unsound[7].

Corrosion can be broken into two types: localized pitting or uniform corrosion over the entire surface. Although pitting corrosion is a primary concern for the pipeline industry, driven piles are intended to carry axial loads, and thus localized pitting may not significantly reduce the load-carrying capacity of the pile. However, uniform corrosion over a large surface, or the clustering of many small pits, may lead to reduced capacity of the pile[7].

PROTECTION METHODS

Several proven methods are currently available to mitigate the risk in corrosive soils. These include concrete encasement, "upsizing" beam size, covering the beams with galvanizing, using cathodic protection and installing protective coatings. In determining suitable protective methods, an owner or design engineer must consider installation costs, additional time requirements for installation, protective characteristics of the method used (both in-place and during installation), and estimated design life once the protective method is put in place.

One of the most common methods to protect steel piles is to apply hot-dipped galvanization to the steel beam. Hot-dipped galvanizing exhibits low corrosion rates in atmospheric service and in mildly corrosive soil conditions, and is applied at a thickness range of 3-to-5 mils or by weight of 1.7-to-3 ounces per square foot. Galvanized structures typically exhibit a low corrosion rate because a continuously passive film, known as a zinc patina, forms on the pure zinc top layer of the galvanized surface when it is exposed to the atmosphere. As the patina starts to develop, a layer of zinc oxide quickly forms as the zinc reacts with oxygen in the air. The zinc oxide layer, when exposed to moisture, converts into a thin layer of zinc hydroxide, which reacts with atmospheric carbon dioxide over time and becomes a dense, insoluble layer of zinc carbonate that slows corrosion of the underlying zinc. Full formation of the protective film generally occurs in 6-to-12 months and is dependent upon storage methods and location after initial application.

In the case of corrosive soil conditions, the expected service life of zinc is greatly reduced. Dissolved chloride content in water is highly corrosive to zinc. Zinc is considered to be an amphoteric material, one that reacts in both highly acidic and highly alkaline environments; pH conditions below 4.5 are highly corrosive to zinc and show the effect of pH on corrosion of zinc or loss rate of 0.8-to-1.2 mils per year[8]. Acid-reducing soils result from the loss of chlorides from constant rain, from natural soil content, or from bacterial growth. When moisture in the soil is above 15-percent, salts will become solubilized in the moisture and further increase the corrosion rate of zinc.

Fast-track construction schedules should also be a concern for design engineers and owners when using galvanized metals. The proper formation of the calcium carbonate protective layer with galvanized metals would require longer lead times and sufficient landscape to store materials prior to installation.

The resulting performance of zinc is greatly diminished without the formation of the protective film.

When normal galvanizing will not provide adequate protection in corrosive soils, design-build firms have proposed upsizing the steel support beam and targeting the dry thickness of galvanizing to a maximum of 5 mils. However, this approach may be deemed cost-prohibitive, as upsizing beams not only adds to material cost but will also add to transportation costs because of the additional load requirements. Upsizing beams, weights and thickness of the zinc essentially provide additional base metal to allow for the higher corrosion rates by offering more sacrificial material,

Fig. 2: Individual H-beams are laid down in the shop and individually blast-cleaned and spray coated before curing and installation. Photos courtesy of the authors unless otherwise noted.

but does not increase or improve the barrier protection and corrosion-resistant characteristics of the process. Rising costs of base metal, zinc and the additional transportation costs continue to make this option less viable and a more expensive solution.

PROTECTIVE COATINGS

Coatings have a long history of use in protecting steel piles. Coatings are designed to provide barrier protection of the coated surface and have dielectric properties that reduce the corrosion current. The American Water Works Association (AWWA) and American Petroleum Institute (API) rely on coatings to protect buried steel piping and supports and have developed numerous standards defining acceptable performance characteristics for coatings in buried conditions.

Today's current coating solutions for buried steel piles exceed the performance capabilities of previously used coating materials and meet the design criteria needed for industrial PV solar farms when placed in corrosive soil conditions. Current coating technology also removes scheduling concerns, as many coatings can be buried in as little as 24 hours after application.

The two generic coating types best suited for buried applications are high-build versions of epoxy and aromatic polyurethane. These products are formulated as ultra-high-solids coatings (up to 100-percent-solids formulations) that provide a thick, dense, low-permeability dried film. These coatings are resistant to abrasion and impact, have high dielectric strength and can protect edges in order to maximize the corrosion-resistant capabilities of the coating. Coatings that have permeability values less than 0.18 U.S. perms provide excellent resistance to moisture migration through the film. Dielectric strength is measured in volts per mil. Coatings with higher dielectric strength will have better resistance to electrical current arising from corrosive conditions. Ultra-high-solids epoxy formulations will have a dielectric strength up to 770 volts per mil and polyurethane will have a strength of 430 volts per mil. Appropriate epoxy coatings that have successfully passed pile driving and extraction tests have impact resistance greater than 20 inch/pounds and abrasion resistance of less than 25-mg loss. Polyurethane coatings exhibit impact resistance greater than 60-inch/pounds and abrasion resistance of less than 110-mg loss. Epoxy coatings can be formulated to have higher edge-retention results of 70 percent to maximize protection along edges in accordance with military performance specification MIL 23236.

It is generally accepted that either epoxy or aromatic polyurethane coatings with the above physical characteristics and formulation for steel will provide a 1-mil-per-year thickness loss (when applied above 20-mils dry-film thickness) in corrosive soil conditions. The minimum desired film thickness of 20 mils should be applied in a single spray coat application. The maximum dry film thickness should be closely related to the surface profile achieved during abrasive blasting; however, up to 50-to-80 mils of coating can be successfully applied to properly prepared steel surfaces in a single coat to increase the total protection capability. State and national design parameters confirm the consensus approval of the 1-mil-per-year corrosion rate utilizing coating systems with lesser performance values than those cited in this article. Historical studies have shown that these coatings are highly resistant to moisture-laden soil with chlorides, not only for piling applications but for 20-year exposures to wet dry cyclic conditions in marine vessels[3]. The performance capabilities of these coatings match the long-term design service life requirements for buried piles in corrosive soils.

APPLICATION AND INSTALLATION

Industrial-scale solar PV projects often take years of planning, permitting and design, but the actual construction activity is performed with extreme efficiency in mind. Hundreds of structural piling units are installed per day. Fabricators are often given very short delivery deadlines and finished fabricated items do not remain in lay-down yards for extended periods of time.

Because H-piles are mechanically driven into the ground when installed, any corrosion protection method must be able to withstand soil shear, impact and the stresses associated with pile driving. Piles and their accompanying corrosion protection must also provide resistance to pull-out and axial loads to ensure stability in changing environmental conditions.

With respect to installation of coated piles, both epoxy and aromatic polyurethane coatings have successfully passed pile-drive tests in rocky soils. Both coating types demonstrate little or no material loss at the driven head or along the edges of the beam. In all cases, no base metal was exposed, confirming that the coatings remained intact during the pile-driving process and resulting in the long-term protection needed for piles located in corrosive conditions.

Modern sophisticated formulations in conjunction with plural-component spray

Fig. 3: Finished, coated H-beams ready for installation in the field.

equipment provide increased film thickness application in a single coat with rapid-curing cycles. The installation process includes surface preparation, application of coating, curing of the applied coating and handling of the equipment and coating material. With surface preparation, common automated mechanical abrasive equipment can blast-clean three steel piles to an SSPC-SP 10/NACE No. 2, "Near-White Blast Cleaning," finish in a matter of 30 seconds — an extremely efficient process of preparing the surface. The surface profile of blast-cleaned steel should have a large angular profile of 4- to-6 mils to adjust for higher film-build thickness of the coating. For coating application and curing, H-beams are typically lined up on supports and a single coat is spray-applied to one side of each beam. After the coating has cured, the beams are flipped and the opposite sides are coated. The coated piles are then removed from the spray area and allowed to fully cure. Epoxy coatings are typically a bit slower than polyurethane to reach dry-to-handle (flip) time. An epoxy coating's dry-to-handle minimum time limit is typically two hours, compared to modern aromatic polyurethanes at 20 minutes. Both products are cured and ready for service in 24 hours.

CONCLUSIONS

Ultimately, not all soils are extensively corrosive. However, when soil conditions do present corrosion challenges, today's advanced coatings provide an improved solution when compared to the alternative protective measures of galvanizing, upsizing steel beams and concrete encasement. Protective coatings provide the barrier protection needed for aggressive and mildly aggressive soil conditions. A qualified corrosion engineer can determine the corrosivity of the soil, predict corrosion rates of base metals, and confirm the suitability of corrosion protection methods for an individual project that will meet the designed service-life requirement.

The advanced surface processes and application methods associated with today's high-build epoxy or polyurethane coatings offer incredible efficiences compared to previous generations of coating product solutions. These coatings cure quickly and are ready for service in 24 hours, which is significant when compared to the amount of time required for zinc coatings to properly form a carbonate-based protective layer. With these efficient processes and products in place, protective coatings installation can dramatically reduce the material impact on construction schedules.

The advances in coating technology and installation processes increase the viability of solutions for solar projects. When working with qualified corrosion engineers, the data from an individual project's soil condition assessment will provide key insights into the need for dielectric coating protection. In any case, coatings should be one of the primary considerations when designing corrosion protection systems for solar piling projects.

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BRING ON THE HEAT:

INFRARED RADIATION THERMAL IMAGING AND COATING APPLICATION

BY DUDLEY J. PRIMEAUX II, PCS, CCI, PRIMEAUX ASSOCIATES LLC

The use of infrared radiation (IR) thermal imaging is not something new to the industry and has shown a wide variety of uses in law enforcement, safety, military, medical, construction and sporting areas. Following the development of IR and thermal imaging (TI), the first commercial IR-TI cameras came into use in the 1960s from the combined efforts of Texas Instruments Inc., Hughes Aircraft Company and Honeywell, employing heat given off by an object to help locate said object[1]. IR-TI works based on emissivity, which is different from night vision, which amplifies or intensifies available light to locate and see objects. Night vision is characterized by the "green glow" in the object area (Fig. 1).

In firefighting applications, IR-TI can provide critical information to size up a fire incident, track fire growth and locate victims, other first responders and egress routes. Over the past several years, the National Institute of Standards and Technology (NIST) Fire Research Division has been developing a suite of performance test methods for inclusion in a national consensus-based standard on thermal imaging cameras used by first responders. The performance metrics are directly related to the environment in which the images are used and the tasks typically performed[2]. The same is true for law enforcement observation work.

A more focused use for this technology would in the construction industry to monitor the insulative properties of structures, heat loss and possible water damage. For instance, Figure 2 shows an IR-TI of a home during the winter, showing potential heat-loss areas. The red-to-white color is the area with the most heat, with blue being the cooler spots. This is the thermal-imaging or Ironbow palette in IR-TI and as one can see, quite a bit of heat loss occurs at window and door areas.

In general construction work, IR-TI has recently shown promise for evaluation of concrete support pillars for strength, which allows for detection of damaged areas in the pillars prior to concrete structural failure occurring[3]. This article will focus on practical applications related to protective coating work.

USE IN COATING APPLICATION

A technical paper was presented at the SSPC 2018 conference on the subject of determining the dry-film thickness (DFT) of applied coating systems[4]. While this was not IR-technology specific, the use of certain filters did provide for visual evaluation of the applied DFT of the coatings. So, let's take this one step further.

What if IR-TI could be used to evaluate and monitor the actual application of coatings? This is an interesting concept that has some practical potential. Because IR-TI works by detecting heat emanating from the item observed, the applied coating system must be of thermoset technology — thermoset coatings are typically exothermic in nature, meaning heat is given off during the reaction and curing stage.

A common thermoset coating system used in protective coatings work consists of two-part, epoxy-based materials. It is well known that two-part epoxy systems are exothermic. If the two components are mixed and then allowed to set in the container for an extended period of time, there will be excessive heat generated, melting a container if that container is made of plastic.

Figure 3 is an IR-TI of spray application of a two-part epoxy system, showing that the spray is hotter (yellow to red color) than the surrounding area (blue to green color), but rapidly cools to the substrate temperature.

In order to demonstrate practical use of the IR-TI during coating application work, it would be best if the applied thermoset coating system would be conducive to thick-film application with a fast reactivity and significant exotherm. The type of coating systems that fall into this category are the fast-set, plural-component polyurea and polyurea/polyurethane hybrid systems[5]. These systems are applied at

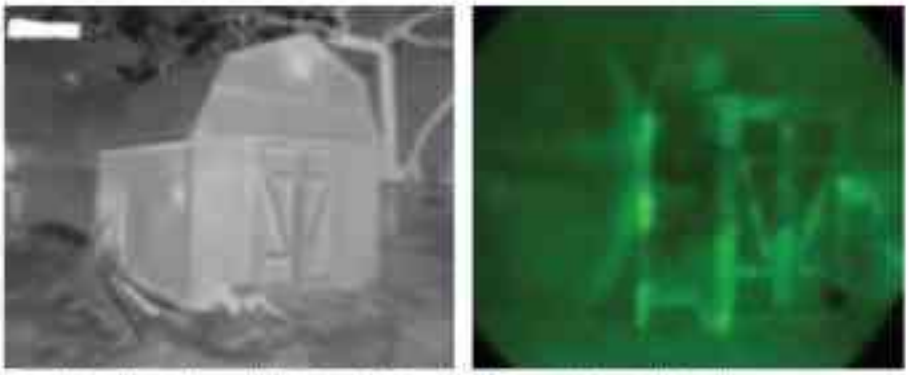

Fig. 1: Infrared thermal image (left) and night vision (right). Figures courtesy of the author.

temperatures and with exotherms exceeding 200 F.

IR-TI IN POLYUREA COATING APPLICATION

An aromatic, fast-set polyurea system was being applied for support and protection of various automotive parts during shipment. The substrate itself is harsh on the parts, so a protective layer of polyurea is applied to cushion and protect against damage during transport.

Figure 4 (p. 24) shows the coated part. Normal visual inspection shows the applied polyurea system to be uniform in application and aesthetically pleasing. Wet-film-thickness (WFT) measurements were not possible during the actual application as the gel time of this polyurea system was about three or four seconds. Gel time for systems is the time that it takes to change from the liquid, fluid state to a solid membrane. Also of note is the temperature of the applied coating within two minutes of application when this photo was taken. Spray application was performed at about 150 F (65 C), so there is cooling after application.

However, when the same coated dunnage pieces are evaluated using IR-TI, a different observation can be noted. In Figure 5 (p. 24), both a white-heat output (white and gray) is used as well as the typical ironbow color IR-TI palettes. One can easily see that there are some lines of delineation on the panel signifying heat emissivity variability in the applied coating system. This can be directly related to variable applied film thickness of the fast-set, thermoset coating technology.

In this situation, it was specified that 20 mils (0.5 mm) of the polyurea system was to be applied, and in this case, the applicator used a single-pass, one-coat technique, which is not necessarily bad practice for paints and coatings in thin-film application. From visual inspection and shown in Figure 4, the applied thickness appeared to be uniform and the correct amount of material had been used per the surface area coated.

Again, the thickness variability was due to the application technique and not the material being used (in this case a fast-set polyurea system). And, even though the thickness averaged out over the panel surface, the thinner areas could lead to poor performance and part failure. Hence, application training and following industry standards of application are important[9].

This type of high-solids coating system should be applied in a multi-coat, crisscross pattern. Spray pattern should overlap at least 50 percent and not match "edge-to-edge" of the spray pattern. This is known standard industry spray technique. And while the "W" technique of application may be employed in roller application of paints and coatings, this is not good practice for spray-applied coating systems. Figure 6 (p. 24) shows IR-TI of both correct and improper spray technique. Visually, the surface of the applied coating was acceptable, but thickness uniformity was not consistent in the improper, W pattern.

One of the more common applications for polyurea and polyurea/polyurethane hybrid spray coating systems is application over a geotextile fabric, primarily used in secondary containment application areas. Direct, simple non-destructive DFT testing is not as easy as if the coating were applied to a solid substrate and meeting required DFT conformance[9, 10]. It has been shown that ultrasonic DFT testing can be performed, but applicators should be versed in the use of this evaluation technique[11].

IR-TI can be used to monitor application consistency, rather than relying on just visual observation. To illustrate this, many uses of the polyurea/geotextile are in the form of in-house, factory-applied polyurea to the geotextile. This

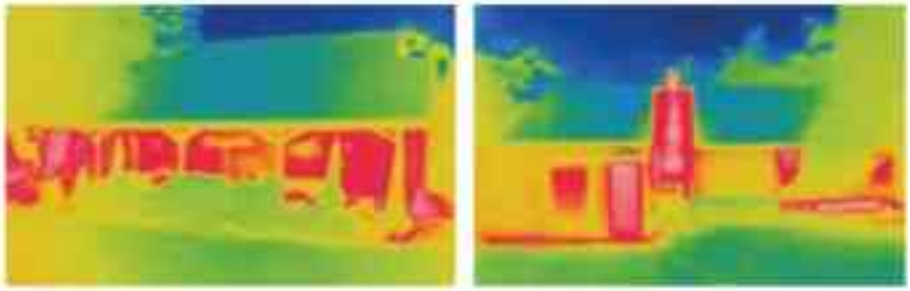

Fig. 2: IR-TI images of a home during the winter showing potential heat-loss areas.

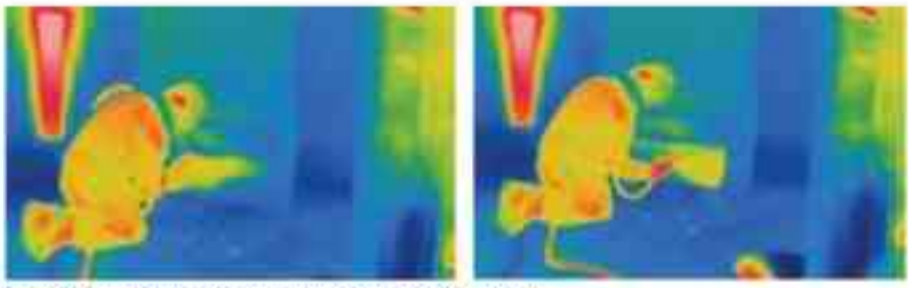

Fig. 3: IR-TI images of a two-part, spray-applied epoxy coating.

Fig. 4: Application of fast-set polyurea to dunnage pieces.

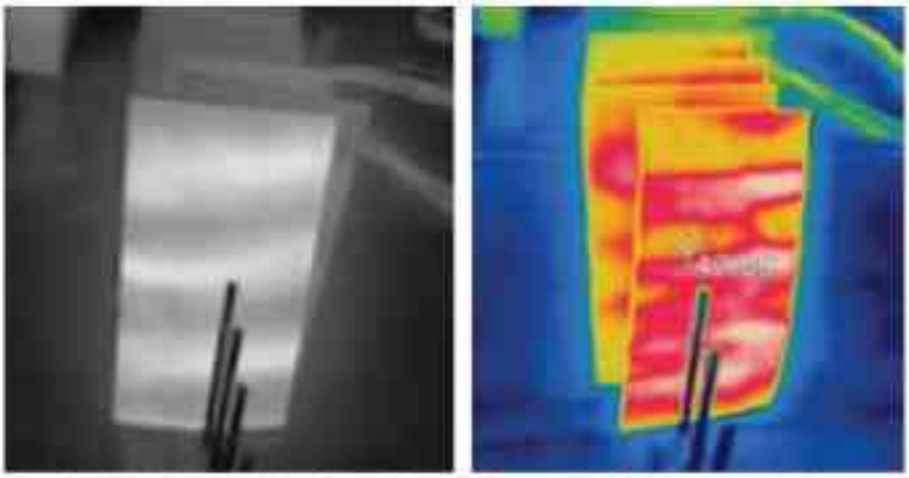

Fig. 5: Coating thickness evaluations of two different panels sprayed with fast-set polyurea. The image on the left shows white heat output with Ironbow (in color) on the right. In the photo on the left, the white areas are hotter and at a higher DFT. In the Ironbow photo, the yellow is cooler as compared to the red. The yellow is the lower DFT and the red is the higher.

helps to ensure consistency and quality in the produced composite panels. Figures 7 and 8 (p. 26) illustrate this work.

In Figure 8, the application of the polyurea systems appears normal. The slight wrinkling of the fabric can be a common occurrence in this type of work and will depend upon the type of fabric used. When viewing the IR-TI in this figure, the thermal signature seems consistent and uniform overall. While both pictures are of the same geotextile coating work, the one on the right is further progressing in the spray processing. The slight wrinkling does have an effect on heat reflectance, which should be accounted for especially in outdoor evaluation work.

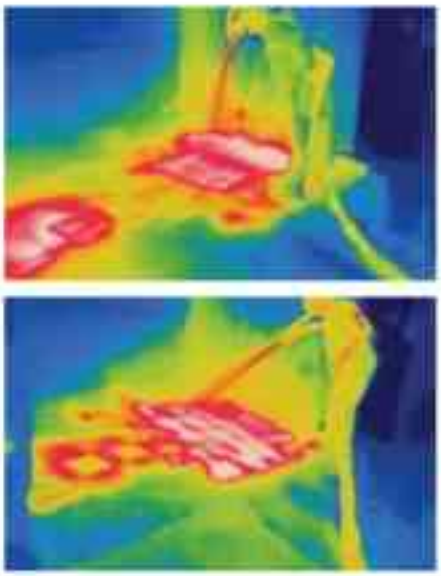

Fig. 6: IR-TI of proper (top) and improper (bottom) spray-application technique.

An important aspect of the fast-set, plural-component polyurea systems is that high processing temperature is required to achieve proper mix and resulting polymer properties[1]. This heat also lowers the mix viscosity and allows the material to flow better on the substrate; i.e., proper substrate wet-out. If the proper temperature is not achieved in application, problems may arise

Fig. 7: Photograph of polyurea/geotextile panel production.

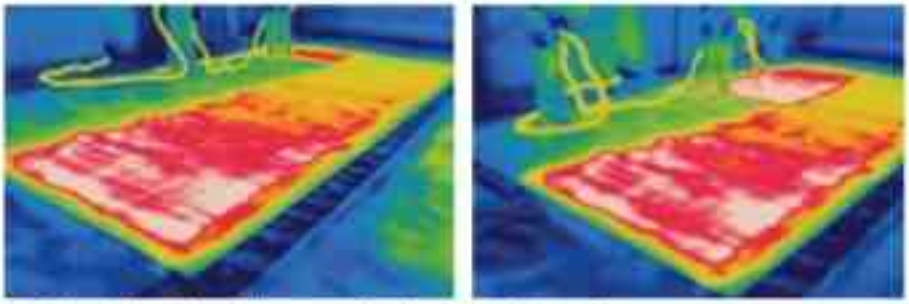

Fig. 8: The slight wrinkling of the same polyurea/geotextile fabric can be a common occurrence.

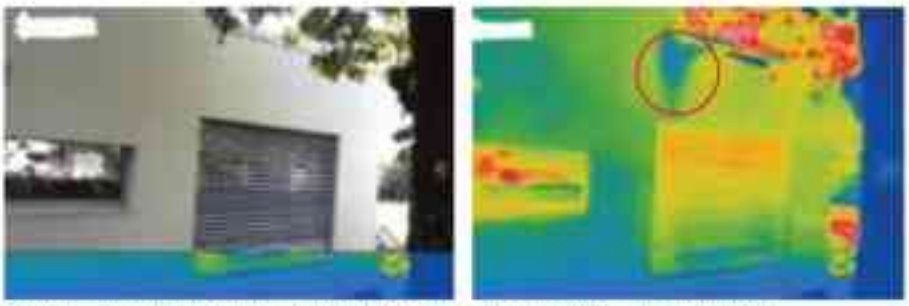

Fig. 9: An area of blistering in an applied coating is detected by the IR-TI image on the right.

related to substrate adhesion or surface aesthetics of the applied polyurea coating system.

Once the coating system has been applied and cured, IR-TI can be used to evaluate the coated surface for voids or blistering of the coating from the substrate. In Figure 9, the blistered area is shown as a light blue color above and to the right of the window area.

CONCLUSION

The use of IR-TI allows one to see what the human eye cannot. In coating application, what may appear by visual observation to be uniform and consistent may be plagued with defects and inconsistencies. Once fast-set, plural-component coatings are applied and allowed to set and cure, DFT measurements can be taken and may require repair to certain areas.

While there can be correlation to applied DFT, at present, this is a tool to monitor application technique as opposed to replacing actual DFT measurements. IR-TI can also be used in video capture as a teaching and training tool for proper application techniques to help ensure consistent application DFT of fast-set, plural-component coating systems. While not absolute, it is a start to real-time monitoring of application, with additional work in progress.

ABOUT THE AUTHOR

Dudley Primeaux is the owner and operator of Primeaux Associates LLC, formed in 2001, providing a variety of consulting, product development, training and inspection

services related to the coatings industry. He was the former director of education and development at VersaFlex Incorporated in Kansas City, Kansas. Primeaux has Bachelor and Master of Science degrees in chemistry from Lamar University in Beaumont, Texas, was employed by Texaco Chemical Company and Huntsman Corporation, was a former partner in EnviroChem Technologies, LLC, and former CSO of Inspar Robotic Technologies, Inc.

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Primeaux is named inventor of 31 U.S. patents and eight European patents, and an accomplished author of over 50 technical publications relating to polyurea elastomeric coating and lining technology, performance testing and inspection.

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NOVEL ISOCYANATE-FREE RESINS FOR ONE-AND TWO-COMPONENT PROTECTIVE COATINGS

BY DENIS HEYMANS AND CATHERINE ROMANOWSKA, HEXION RESEARCH BELGIUM; AND MARCELO HERSZENHAUT, HEXION INC.

Two-component polyurethane systems (2K PU) are the most widely used topcoats for high-quality protective applications. These coatings combine outstanding chemical and weathering resistance with excellent mechanical properties, but environmental, market and cost pressures have led to the development of alternatives to these conventional topcoats, including isocyanate-free binders. Besides conventional acrylic monomers, polymer chemists have at their disposal various versatile building blocks, such as neoacid derivatives. Neoacid esters are widely used to upgrade solvent and waterborne resins for both decorative and protective coatings. Among other benefits, these very hydrophobic monomers reduce surface tension and improve flow, durability, chemical and UV resistance.

This article presents a new family of polymers, combining neoacid esters and alkoxysilane monomers. Variation of process parameters, monomer composition and level of alkoxysilane yielded a series of polymers with a range of properties. Polymers with solids content ranging from 70-to-100 percent were produced using this technology and formulated into one-component (1K) and 2K protective coatings — both clear and pigmented. These coatings were then compared to 2K polyurethane and acrylic silane systems for typical performance parameters.

2K PU COATING SYSTEMS

In these systems, it is usual to cross-link polyester and/or acrylic polyol resins with aliphatic isocyanates based on hexamethylene or isophorone backbones. These coatings combine outstanding chemical and weathering resistance with excellent mechanical properties.

However, 2K PUs also have shortcomings. Handling of the isocyanate cross-linkers presents potential exposure of workers to these hazardous chemicals, especially during spray application. In addition, isocyanates must be mixed in correct proportion with the polyols shortly before application — typically 30 minutes to two hours. After this period, the product's viscosity increases too much to be sprayed and any unused mix must be disposed of safely. This disposal results in material waste and thus, in overall increased usage cost.

ALKOXYSILANES IN COATINGS

High-durability coatings increasingly take advantage of resins based on silane chemistry. The combination of silane and organic monomers offers the synthetic chemist an infinity of possibilities to optimize resin performance. Such copolymers are now used for protective applications including marine, railways, chemical plants and bridge coatings. Organo-silane polymers are mostly appreciated for their very high durability and have replaced polyurethanes in some cases. In particular, acrylic-silane systems have exhibited excellent weathering resistance[1].

Acrylic-silane resins can be manufactured via radical copolymerization of silane-functional acrylate and methacrylate monomers. Most commonly, γ-methacryloxypropyl-trimethoxysilane (MPTMS) is reacted with methyl methacrylate, butyl acrylate and styrene or other vinyl monomers to form linear copolymers with pendant alkoxysilane groups. In theory, these resins can be formulated as 1K systems because they contain moisture-curable silane groups. Thus, ambient moisture would be a catalyst for the cross-linking reaction (Fig. 1). Park et al. observed excellent UV and weathering resistance in moisture-cured coatings based on alkoxysilane-acrylic resins with a high level of MPTMS, up to 30-weight percent[2].

Despite the high potential of siloxane-based resins, so far, 1K moisture-cure coatings based on this chemistry have only reached limited market penetration. The high price of these resins, mostly due to the high cost of siloxane monomers, is probably partly responsible for this. Aside from price, these systems present an additional number of drawbacks. For ease of application (in particular spraying), especially when formulated into pigmented systems, acrylic-silane systems must use polymers with relatively low molecular weights. Polymers with such low molecular weights often require long curing times to develop mechanical properties, more so when applied at low temperatures[3,4].

NEOCARBOXYLIC ACID MONOMERS FOR COATINGS

In 1955, Koch, Gilfert and Hurisken of the Max Planck Institute in Germany, described a three-step chemical reaction between mono-olefins, carbon monoxide and water leading to synthetic monocarboxylic acids[5]. Acids prepared by this process are known as Koch acids or neocarboxylic acids. There are various grades of neocarboxylic acids available commercially, most notably neopentanoic and neodecanoic acid. Because of their bulky, branched structures, these acids lack reactivity to achieve high conversion

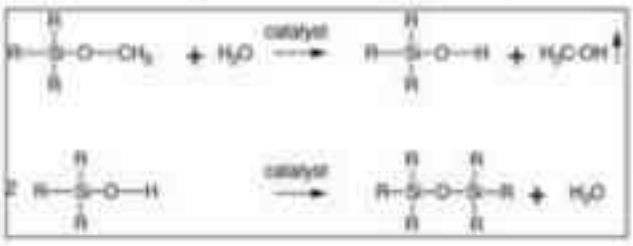

Fig. 1. Moisture curing of alkoxysilane-based coatings. All figures courtesy of the authors.

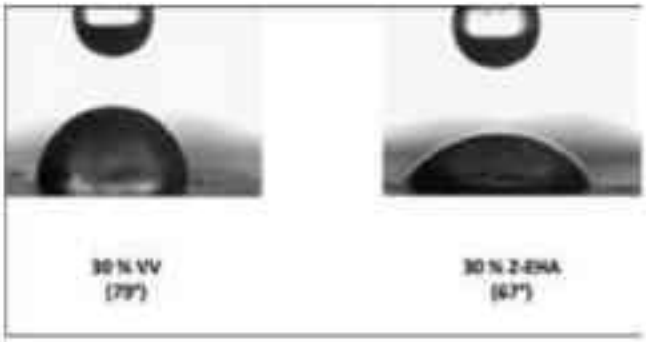

Fig. 2: Contact angle of acrylic copolymers with 30-weight percent vinyl neodecanoate (VV) or 2-ethylhexyl acrylate (2-EHA), respectively.

Fig. 3: Proposed space for the new binder technology.

in conventional esterification reactions. Therefore, neocarboxylic acids are converted into derivatives, of which the vinyl or glycidyl esters find broad use in polymer synthesis.

Nowadays, monomers based on neoacids find most of their applications in the world of coatings, where they are well-known for upgrading the performance of vinyl, acrylic, polyester and other resins. The most common monomers used in these applications, based on C10 acids, are glycidyl neodecanoate and vinyl neodecanoate, with three to six methyl groups per molecule.

The highly branched chemical structure, the strong aliphatic character and the molecular bulkiness confer a number of very attractive properties to these vinyl and glycidyl monomers, reflected in the properties of the coatings in which they are used. The homopolymer of vinyl neodecanoate has a critical surface tension of 24 dyn/cm[1] and the presence of this monomer brings high contact angles to derived coatings (Fig. 2). Moreover, the tertiary structure of the acid chain ensures excellent chemical stability[2] and the absence of aromatic structures explains excellent UV resistance.

THE EXPERIMENTAL PART

In the present work, vinyl neoesters and alkoxysilane monomers were copolymerized to produce a series of resins. These silane-vinyl resins were then formulated into 1K moisture-cured coatings. Variables evaluated in the synthesis of resins include the following.

- Vinyl neoester monomer type and concentration.
- Fox-predicted glass transition temperature.
- Nature and concentration of alkoxysilane.
- Nature and concentration of other monomers (if present).
- Process parameters (for example, reaction temperature and time, initiator type and concentration).

A number of variables were considered in the moisture-cured coatings, including the following.

- The nature and concentration of solvents and catalysts.
- The use of moisture scavengers and additives to stabilize the coatings.

While the study focused on hardness development of the coatings, other performance properties were evaluated, such as accelerated weathering resistance, water contact angle, gloss, abrasion resistance, volatile emissions and viscosity. For the sake of brevity, this text discusses only the effect of a few selected variables (percentage of alkoxysilane monomer and resin glass transition temperature [Tg]) on the most important performance parameters (pot life, hardness development, and solvent and weathering resistance). The work was aimed at developing a versatile binder system that could bridge several application areas currently covered by other types of coatings, offering a more attractive cost-performance balance, as indicated in Figure 3.

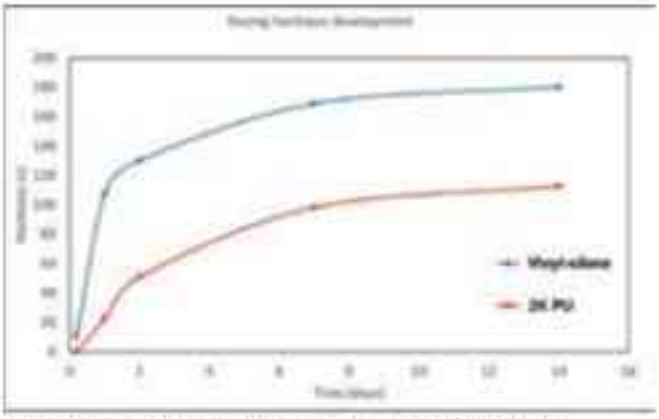

Fig. 4: Hardness development of vinyl-silane and 2K PU clearcoat.

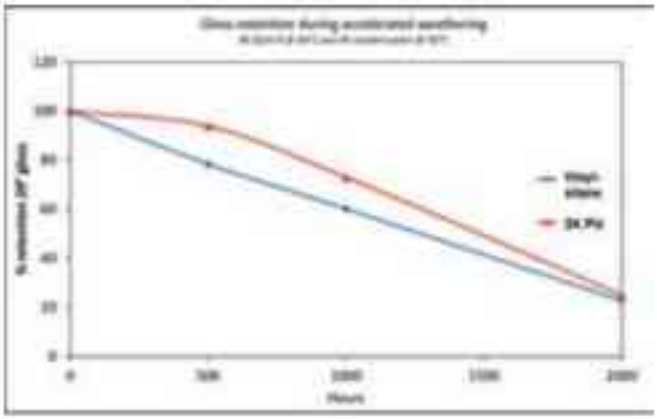

Fig. 5: Accelerated weathering of vinyl-silane and 2K PU clearcoat.

RESIN PREPARATION

Resins discussed here combine methoxysilane monomers, vinyl neodecanoate and/or vinyl nononanoate. Monomer choice resulted from a desire to combine the unique properties of neoacid derivatives, such as hydrophobicity and durability, with the moisture-curing mechanism of

Table 1: Comparison Between a Vinyl-Silane and a 2K PU Clearcoat.

Property	Novel Resin Example 1	Commercial 2K PU
As supplied		
Type	Moisture-cure (1K)	Isocyanate-cure (2K)
Solids	80%	70%
Viscosity	10,000 mPa.s	4,000 mPa.s
Formulated for application		
Solids	60%	50%
Viscosity	100 mPa.s	100 mPa.s
Pot life	> 24 months	~ 4 h
Gloss, 20°/60°	116/120	125/126
Water contact angle	84.3	83.1
Dust-free time (150 µm wet)	< 12 min	< 20 min
Koenig hardness development	107 s (24h) 180 s (14d)	22 s (24h) 113 s (14d)
MEK rubs	180 cycles	> 200 cycles

Table 2: Comparison Between a Vinyl-Silane, a 2K PU and an Acrylic-Silane White Topcoat.

Property	Novel Resin Example 2	2K PU	Commercial Acrylic-Silane
As supplied			
Type	Moisture-cure (1K)	Isocyanate (2K)	Moisture-cure
Solids	68%	65%	68%
Viscosity	70 KU	65 KU	80 KU
Ready to apply			
Solids	68%	70%	68%
Viscosity (Krebs units)	70 KU	72 KU	80 KU
Pot life	> 3 months	8h	Endless
Gloss, 60°	80	96	83
Water contact angle	90	78	90
DFT (150 µm wet)	< 40 min	< 60 min	< 70 min
Koenig hardness development	32s (24h) 110 (14d)	15s (24h) 126 (14d)	19 s (24h) 70 s (14d)
MEK rubs (# cycles)	> 200 cycles	> 200 cycles	> 200 cycles
Cross cut (classification ISO -ASTM)	2 – 3B	0 – 5B	2 – 3B

methoxysilanes. The glass transition temperature of the polymers was manipulated by varying the ratio between vinyl neodecanoate and vinyl neononanoate (homopolymer Tgs of -3 and +70 C, respectively). The molecular weight of the polymers was varied by modification of the process conditions and the use of low levels of some additional monomers. All polymers were prepared in n-Butyl acetate.

COATING PREPARATION

The various resins were mixed with catalysts and diluted with butyl acetate to the application viscosity (100 mPas) before application at 150 µm wet with a bar coater. Films were then dried at 23 C and 50-percent relative humidity (RH). Typical solids content of the clearcoats ranged from 65-to-70-weight percent. A commercial 60-weight-percent solid 2K PU system was included for reference purposes. White coatings were also formulated and tested against commercial references (2K PU and acrylic-silane).

POT LIFE OF THE COATINGS

A quick way to assess pot life of ready-to-apply coatings is to determine the time at which the viscosity has doubled from its original value. After that time, the coating may no longer perform as initially designed and should be tested prior to field application. All clearcoats prepared according to the proprietary route had pot lives of several months, despite being fully catalyzed and ready for application. In some cases, skin formation was observed on the top of the product in cans that had been open several times, indicating reaction with moisture from the air. In all cases, the bulk viscosity of the coatings remained constant. This important observation indicates that vinyl silane resins are suitable for truly 1K coatings. For comparison, a lab-made clearcoat based on acrylic-silane resins and used as reference had a pot life of less than one hour. The reference polyurethane had a pot life of two hours.

CLEARCOAT PROPERTIES

Table 1 shows the properties of a typical clearcoat based on a vinyl-neoester/alkoxysilane polymer, compared to those of a commercial 2K PU clearcoat. It is easy to see that the vinyl-silane coating exhibits overall properties very close to those of the commercial 2K PU, with the exception of the following.

- Being a 1K system.
- Having a much longer pot life.
- Showing a much faster Koenig hardness development (Fig. 4, p. 29) and reaching a higher level of final hardness.

Figure 5 (p. 29) shows the results of accelerated weathering (QUV-B) of the two clearcoats, indicating that the vinyl-silane system can achieve similar performance to the 2K PU.

WHITE PIGMENTED COATING PROPERTIES

Table 2 shows the properties of a simple white topcoat based on a vinyl-neoester/alkoxysilane polymer compared to those of a commercial 2K PU clearcoat and a commercial acrylic-silane.

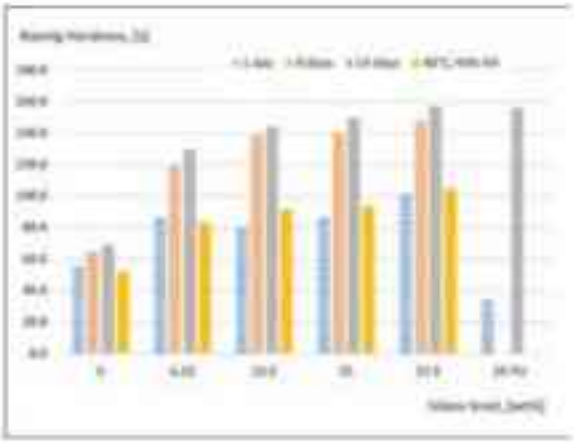

Fig. 6: Koenig hardness development of clearcoats with increasing level of silane monomers compared to a commercial 2K PU clearcoat.

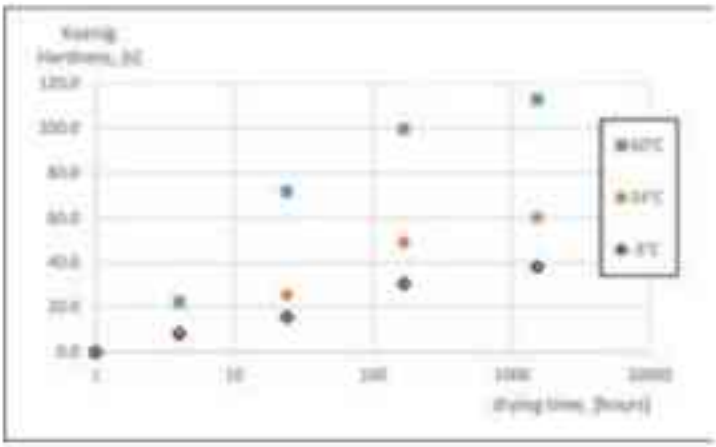

Fig. 7: Hardness evolution of clearcoats from resins with different estimated Tg (25 weight percent silane monomer).

Also, in a white pigmented system, the vinyl-silane coating exhibits overall properties very close to those of the commercial references.

NOT A SINGLE RESIN, YET A FAMILY OF POSSIBILITIES

The graphs and tables shown thus far display single-point performance data, i.e., they refer to a specific vinyl-silane binder system. In order to present these results, this study performed a scan of a broad range of variables, which allowed the authors to build a toolbox, linking resin composition and coating performance.

THE EFFECT OF THE LEVEL OF SILANE MONOMER

The level of silane monomer was varied from zero to 37.5 percent in a series of resins with similar composition and Tg (60 C). Figure 6 shows the Koenig hardness development of clearcoats based on these resins, compared to the commercial 2K polyurethane benchmark. In addition to the room temperature curing (23 C, 50 percent RH), some films were also force-cured for four days at 40 C and 90 percent RH. After one day, all silane-based systems were significantly harder than the polyurethane

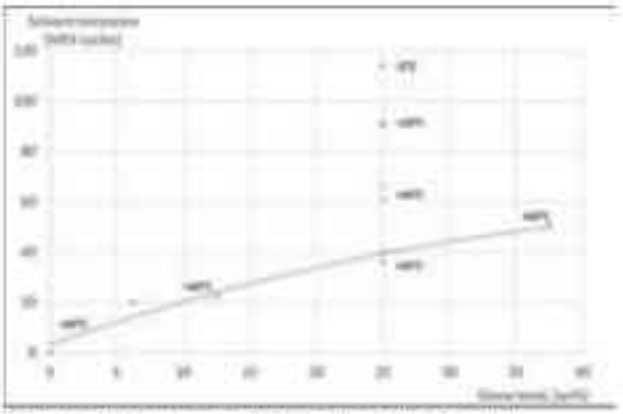

Fig. 8: The effect of the level of silane and resin Tg on solvent resistance of clearcoats.

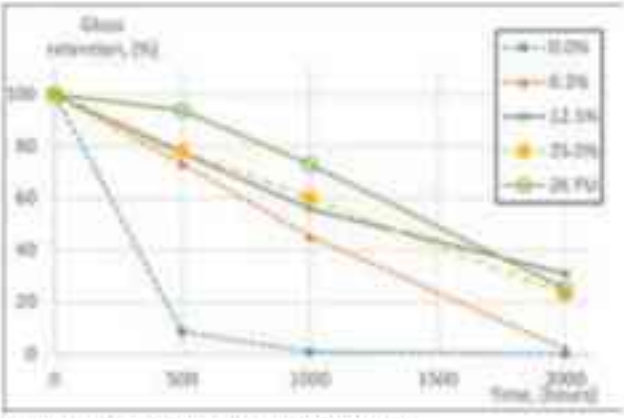

Fig. 9: The effect of silane level on gloss retention.

benchmark. Increasing the silane level up to about 12.5 percent resulted in higher hardness due to cross-linking as expected.

THE EFFECT OF RESIN GLASS TRANSITION TEMPERATURE

The Tg of the polymers was decreased in a second series of resins from 60 C to -3 C by using vinyl neodecanoate rather than vinyl neononanoate, with a fixed concentration of 25 percent vinyl trimethoxy silane monomer. Figure 7 (p. 31) shows that, as expected, the rate of hardness development and the final hardness of the derived coatings was significantly reduced with decreasing Tg.

SOLVENT RESISTANCE

Figure 8 shows the solvent resistance of a series of clearcoats as a function of the level of silane monomer after seven days of drying at room temperature. Additionally, resins with 25-weight-percent silane and Tg from +60 C to -3 C were included in this evaluation. As expected, solvent resistance increases with the level of crosslinking monomers.

WEATHERING PERFORMANCE

Cold-rolled steel panels coated with clearcoats were placed in a QUV chamber for 2,000 hours. The accelerated weathering tests consisted of cycles of four hours of QUV-B at 60 C followed by four hours of condensation at 50 C. Durability of the coatings was assessed by gloss retention after 500, 1,000 and 2,000 hours of exposure. Figure 9 shows the gloss retention of these coatings. Gloss retention increased with the concentration of silane up to a level of 12 to 25 percent. At this level, gloss retention after 2,000 hours is similar to that of the reference polyurethane system.

CONCLUSIONS

Resins combining vinyl neoesters and alkoxysilane monomers can be formulated into 1K coatings with pot lives of at least several months. Unlike with 2K systems, end users would not need to mix two components shortly before use. Also, vinyl silane systems are free of toxic isocyanates. High-solids coatings based on vinyl silane binders potentially dry faster, can be formulated at higher solids than 2K PU systems and can offer similar weathering performance. With an adequate choice of alkoxysilane monomer, vinyl silane systems exhibit lower costs than alternative chemistries, while offering overall improved performance to the coatings formulator and end-user.

ABOUT THE AUTHORS

Denis Heymans holds an engineering degree from the Institut Meurice Chimie and a master's degree in polymer science from the Université Catholique de Louvain in Belgium. He has 27 years of experience in the development of acrylic, vinyl and polyester binders for decorative and protective coatings. Heymans is now senior technology leader at Hexion EMEAI in charge of research and technical service for VeoVa, Cardura and Versatic products.

Catherine Romanowska holds a bachelor's degree in chemistry and biotechnology from Institute Paul Lambin in Brussels. She has five years of experience in the development of acrylic and vinyl binders for protective coatings and decorative paints.

Marcelo Herszenhaut received his Bachelor of Science degree in chemical engineering from the Military Engineering Institute in Rio de Janeiro. He's held technical, sales and management positions in the chemical industry. Herszenhaut has broad experience in lubricants, basic petrochemicals, polymers, high-performance synthetic fibers and coatings. He is currently the marketing manager for Hexion's Versatic business unit Americas and is also responsible for the Versatic Acids platform.

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2019 ANNUAL COATING SYSTEMS BUYING GUIDE FOR STEEL

The 2019 JPCL Annual Coating Systems Buying Guide for Steel features over 140 coating manufacturers and provides details about high-performance coating systems suitable for steel substrates on bridges, in chemical and petrochemical plants, food and pharmaceutical plants, marine and offshore structures, railcars, power plants, transmission pipelines, wastewater facilities, water works, and waterfront, locks and dams, as well as specialty-function applications. The Guide is published as a resource for facility owners, third-party specifiers, contractors and anyone engaged in a coatings project. It allows the user to identify systems that companies recommend for specific applications, exposures, substrates and specialty functions.

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EXTERIOR WEATHERING - MILD/ MODERATE

3M Corrosion Protection Products
Scotchkote
Fusion-Bonded Epoxy (1-2 coats)
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
Albi Mfg. A Division of StanChem Inc.
Albi Primer
Other
APV Engineered Coatings
NeverFade(R)
Epoxy (1-2 coats)/Fluoropolymer
ARCOR - Novolac Epoxy Technologies Inc
ARCOR 1121
Epoxy/Epoxy 100% solids
Arma Coatings
Arma 901 Polyurea 50DS
Polyurea Pure (1, 2, or 3 coats)
ArmorThane USA Inc.
HighLine 310
Polyurea Hybrid (1, 2, or 3 coats)
Autonomic Materials.
Amparmor Self Healing Microcapsules
Zinc-rich, organic
Axalta
Plascoat PPA 571
Polyester/Polyester/Polyester
Bowers Industrial
Gulf Coast Paint
Epoxy (1-2 coats)/Urethane
Burke Industrial Coatings
Liquid 316 Stainless Steel
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Carboline Company
Carbozinc/Carboguard/Carbothane
Inorganic Zinc/Epoxy/Urethane
Chemline Inc
Bridge-Tech
Polyurea Pure (1, 2, or 3 coats)
CIM Industries
CIM 1000
Epoxy (1-2 coats)/Urethane
Cloverdale Paint Inc.
Armourshield
Epoxy (1-2 coats)/Urethane
Coatings For Industry, Inc.
U-Series
Urethane/Urethane
Concrete Solutions by Rhino Linings
Concrete Solutions® HP Urethane
Urethane/Urethane
Cortec Corporation
VpCI-3962/395/384
Organic Zinc/Urethane/Urethane
Cote-L Industries Inc.
durabak 18
Urethane/Urethane
Creative Material Technologies, Ltd.
RUST Rx
Zinc-rich, organic
CSL Silicones Inc.
SiCoat 580
Siloxane/Siloxane
Dampney Co., Inc.
Thurmalox
Epoxy/Epoxy 100% solids
Daubert Cromwell
Versil-Pak
Tape Wraps
Denso North America
Denso
Tape Wraps
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Organic Zinc/Epoxy/Urethane
Diamond Vogel Inc.
Iron Prime 600/Finium DTM-AT/Finium DTM-AT
Alkyd/Acrylic/Acrylic
Duromar, Inc.
HPL-1110/HPL-1110
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
ENESEAL CR
Other
Eoncoat LLC
EonCoat 0 VOC
Other
ErgonArmor Novocoat
Novocoat RI-80
Epoxy Flake Filled/Epoxy Flake Filled
Fabick, Inc. - Coatings and Sealants
Fabick
Polyurea Pure (1, 2, or 3 coats)
Farwest Corrosion Control Company
3M and Denso
Epoxy 100% Solids (1 or 2 Coats)
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
RUSTOP/Bio-SAFE MaxLife
Alkyd/Acrylic/Acrylic
G.D.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / CT-370 Acrylic Aliphatic Poly
Epoxy (1-2 coats)/Urethane
Hempel A/S
Hempadur
Epoxy (1-2 coats)/Urethane
Heresite Protective Coatings, LLC
Heresite Protective Coatings
Phenolic/Fusion-Bonded Epoxy
Highland International
Spray-Safe: 475R/668
Epoxy (1-2 coats)/Urethane
Hy-Tech Thermal Solutions
METAL SHIELD
Calcium Sulphonate
Induron Coatings, LLC
Indurethane 6600 Plus
MCU Zinc Rich/Epoxy/Urethane
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Cellulose Corporation
K-13
Other
International Metalizing Corporation
Reddevil BBB
Thermal Spray
International Paint LLC
International
Organic Zinc/Epoxy/Urethane
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps

BRIDGES

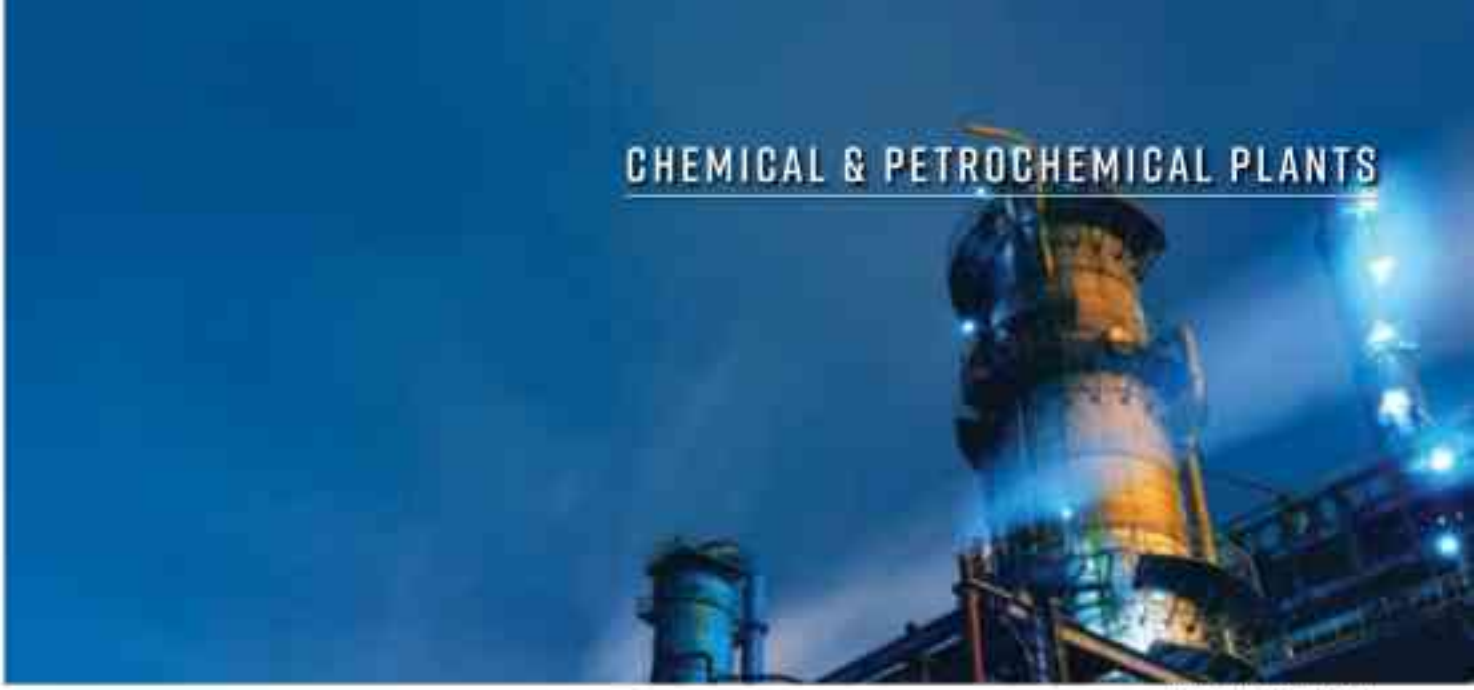
Jotun Paints Inc.
Barrier / Hardtop AX
Organic Zinc/Urethane/Urethane
Kaufman Products, Inc.
SurePoxy HiBild
Epoxy 100% Solids (1 or 2 Coats)
Kemper System America, Inc.
Kemperol 2K-PUR
Urethane/Urethane
Lalita Infraprojects Pvt Ltd
DUARIPOXY 10
Organic Zinc/Epoxy/Epoxy
Maxon Technologies
CRS
Other
Micor Company, Inc.
Micorthane 6-25
Urethane/Urethane
Monopole, Inc.
Monobond III
Organic Zinc/Urethane/Urethane
New Guard Coatings Inc.
Jotamastic/Hardtop/Amercoat
Epoxy (1-2 coats)/Urethane
Nukote Coating Systems International
Nukote PA II
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy/Epoxy 100% solids
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HRZS® Primer/Ply-Guard AS
Inorganic Zinc/Polyurea Hybrid
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat 68HS / PSX-700
Organic Zinc/Siloxane
Premier Coating Systems Inc
PCS-#1111 / PCS-#4300
Epoxy (1-2 coats)/Fluorourethane
Protek Paint Ltd.
Protek urethane
Urethane/Urethane
Randolph Products
Randolph Products RP 250
Epoxy/Epoxy
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Riley Paint Company
Riley Paint
Alkyd/Alkyd/Alkyd
Sherwin-Williams
Zinc Clad 4100 / Macropoxy 646 / Acrolon 218 HS
Organic Zinc/Epoxy/Urethane
Specialty Products, Inc. (SPI)
HT-5L w/AE-4, HT-100F w/AE-4, ElastaFLEX HP
Polyurea Pure (1, 2, or 3 coats)
Stirling Lloyd Group Plc.
Eliminator
Methyl Methacrylate/Methyl Methacrylate
Synavax, Inc.
Heat Shield PT
Thermal Spray
Termarust Technologies Inc.
Termarust TR2000 HR CSA Series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane
Textured Coatings of America
REFLECT TEC
Epoxy (1-2 coats)/Fluoropolymer
ThermaCote, Inc.
ThermaCote®
Other (less than 100 g/L)
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
TOWER-GARD 568
Epoxy/Epoxy 100% solids
The Thortex Group
3M Scotchkote Encapsulation Coating Poly-Nox T36
Other
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
Tnemec Company, Inc.
Epoxoline/Endura-Shield
Epoxy (1-2 coats)/Urethane
U.S. Coatings, LLC
ZincGard/UreGnp
Inorganic Zinc/Epoxy/Urethane
US Coating Solutions
Flex-Clear Urethane
Urethane/Urethane
Valentus Specialty Chemicals
VSC
Organic Zinc/Epoxy/Urethane
Vector Corrosion Technologies
Galvanode ZincTape
Tape Wraps
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Volatile Free, Inc.
Volatile Free, Inc.
Polyurea Hybrid (1, 2, or 3 coats)
Watson Coatings, Inc.
Armor-Shield
Calcium Sulphonate
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

EXTERIOR WEATHERING - SEVERE

3L&T Inc.
CorrosionGard-505
Epoxy/Epoxy 100% solids
3M Corrosion Protection Products
Scotchkote
Fusion-Bonded Epoxy (1-2 coats)
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
APV Engineered Coatings
NeverFade
Inorganic Zinc/Epoxy/Fluoropolymer
ARCOR - Novolac Epoxy Technologies Inc
ARCOR 1321
Epoxy/Epoxy 100% solids
Arma Coatings
Arma 90150DS or 60D
Polyurea Pure (1, 2, or 3 coats)
ArmorThane USA Inc.
HighLine 410
Polyurea Pure (1, 2, or 3 coats)
Autonomic Materials.
Amparmor Self Healing Microcapsules
Zinc-rich, organic
Axalta
Plascoat PPA 571
Polyester/Polyester/Polyester
Bowers Industrial
Gulf Coast Paint
Epoxy (1-2 coats)/Urethane
Burke Industrial Coatings
316 Stainless Steel
Epoxy/Epoxy
Carboline Company
Carbozinc/Carboguard/Carbothane
Organic Zinc/Epoxy/Urethane
Chemline Inc
Bridge-Tech
Polyurea Pure (1, 2, or 3 coats)
CIM Industries
CIM 1000
Epoxy (1-2 coats)/Urethane
Cloverdale Paint Inc.
Armourshield
Organic Zinc/Epoxy/Urethane
Coatings For Industry, Inc.
U-Series
MCU Zinc Rich/Urethane/Urethane
Cortec Corporation
VpCI 396Z/396/384
Organic Zinc/Urethane/Urethane
Cote-L Industries Inc.
durabak 18
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR
Polyurea Pure (1, 2, or 3 coats)
CSL Silicones Inc.
SiCoat 580
Siloxane/Siloxane
Dampney Co., Inc.
Thurmalox
Zinc-rich, inorganic
Daubert Cromwell
Vessil-Pak
Tape Wraps
Denso North America
Denso
Tape Wraps
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Organic Zinc/Epoxy/Urethane
Diamond Vogel Inc.
Endura-Zinc 768/Mult-E-Prime 500/Multi-Thane 330 or
Organic Zinc/Epoxy/Urethane

Duromar, Inc.
HPL-1110/HPL-1110
Epoxy/Epoxy 100% solids
ENECON Corporation
ENESEAL CR
Other
Eoncoat LLC
EonCoat 0 VOC
Other
ErgonArmor Novocoat
Novocoat SP2410
Epoxy 100% Solids (1 or 2 Coats)
Fabick, Inc. - Coatings and Sealants
Fabick
Polyurea Pure (1, 2, or 3 coats)
Farwest Corrosion Control Company
Trenton
Tape Wraps
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
RUSTOP/ Bio-SAFE MaxiLife
Alkyd/Acrylic/Acrylic
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / CT-370 Acrylic Aliphatic Poly
Epoxy (1-2 coats)/Urethane
Hempel A/S
AvantGuard
Organic Zinc/Epoxy/Urethane
Highland International
Spray-Safe 325R/475R/68R
Organic Zinc/Epoxy/Urethane
Hy-Tech Thermal Solutions
METAL SHIELD
Calcium Sulphonate
Induron Coatings, LLC
Perma-Gloss
Organic Zinc/Epoxy/Fluorourethane
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Metalizing Corporation
Reddevil888
Thermal Spray
International Paint LLC
International
Inorganic Zinc/Epoxy/Siloxane
IXS Coatings/Ultimate Linings
UL XP 6613
Polyurea Pure (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps
Jotun Paints Inc.
Resist 86 AV / Penguard Express/ Hardtop AX
Inorganic Zinc/Epoxy/Urethane
Kaufman Products, Inc.
SureProxy HiBild
Epoxy 100% Solids (1 or 2 Coats)
Kemper System America, Inc.
Kemperol 2K-PUR
Urethane/Urethane
Lalita Infraprojects Pvt Ltd
DUARITHANE 10
Urethane/Urethane
Maxon Technologies
CRS
Other
Monopole, Inc.
Permashield 200
Urethane/Urethane
New Guard Coatings Inc.
Barrier/Jotamastic/Hardtop/Amercoat/Amerlock
Organic Zinc/Epoxy/Urethane
Nukote Coating Systems International
Nukote PA II
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy/Epoxy 100% solids
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HRZS® Primer/Ply Guard AS
Inorganic Zinc/Polyurea Hybrid
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Dimetcote 9H / Amercoat 385 / Amercoat 450H
Inorganic Zinc/Epoxy/Urethane
Premier Coating Systems Inc
PCS-81111 / PCS-84300
Epoxy (1-2 coats)/Fluoroorethane
Randolph Products
Polysiloxane nonskid
Epoxy/Epoxy/Siloxane
Rhino Linings
Rhino Linings™ Epoxy
Epoxy/Epoxy Novolac/Epoxy Novolac
Riley Paint Company
Riley Paint
Epoxy (1-2 coats)/Urethane

Sherwin-Williams
Zinc Clad 4100/ Macropoxy 646 / FluoroKem
Organic Zinc/Epoxy/Fluorourethane
Specialty Products, Inc. (SPI)
ULTRA BOND-100, KS
Polyurea Pure (1, 2, or 3 coats)
Stirling Lloyd Group Plc.
Eliminator
Methyl Methacrylate/Methyl Methacrylate
Stronghold Coating Systems
Repa Coat
Epoxy/Polyester/Polyester
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Synavax, Inc.
Heat Shield PT
Thermal Spray
Termarust Technologies Inc.
Termarust TR2000 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane
Textured Coatings of America
REFLECT TEC
Epoxy (1-2 coats)/Fluoropolymer
ThermaCote, Inc.
ThermaCote®
Other (less than 100 g/L)
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
TOWER-GARD 568
Epoxy/Epoxy 100% solids
The Thortex Group
3M Scotchkote Encapsulation Coating Poly-Nox T36
Other
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
Tnemec Company, Inc.
Tneme-Zinc/Epoxoline/Fluoronar
Organic Zinc/Epoxy/Fluorourethane
U.S. Coatings, LLC
ZincGard/EpoxyGrip/UreGrip
Inorganic Zinc/Epoxy/Urethane
US Coating Solutions
Flex-Clear Urethane
Urethane/Urethane
Valentus Specialty Chemicals
VSC
Organic Zinc/Epoxy/Urethane
Vector Corrosion Technologies
Galvanode ZincTape
Tape Wraps
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Watson Coatings, Inc.
Armor-Shield
Calcium Sulphonate
ZRC Worldwide
ZRC Zero-VOC Galvanizing Compound
Zinc-rich, inorganic



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EXTERIOR PLANT EXPOSURE - MODERATE TO SEVERE CHEMICAL, WEATHERING, & UV

3M Corrosion Protection Products
Scotchkote
Epoxy (1-2 coats)/Urethane
Advanced Polymer Coatings (APC)
Chemline
Siloxane/Siloxane
Albi Mfg. A Division of StanChem Inc.
Albi Clad 800 Intumescent
Other
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-15
Epoxy 100% Solids (1 or 2 Coats)
Atlas Minerals & Chemicals, Inc.
Rezklad
Epoxy 100% Solids (1 or 2 Coats)
Autonomic Materials.
Amparmor Self Healing Microcapsules
Zinc-rich, organic
Axalta
Alesta
Epoxy (1-2 coats)/Fluoropolymer
Bowers Industrial
Gulf Coast Paint
Epoxy (1-2 coats)/Urethane
Carboline Company
Carbozinc/Carboguard/Carbothane
Inorganic Zinc/Epoxy/Urethane
Ceilcote (International Paint LLC)
Ceilcote/Flakeline
Vinyl Ester/Vinyl Ester/Vinyl Ester
Chemline Inc
Chemline ARC
Polyurea Pure (1, 2, or 3 coats)
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
Cloverdale Paint Inc.
Armourshield
Epoxy (1-2 coats)/Urethane
Coatings For Industry, Inc.
U-Series
Epoxy (1-2 coats)/Urethane
Cortec Corporation
VpCI-396Z/396/384
Organic Zinc/Urethane/Urethane
Cote-L Industries Inc.
durabak 18
Urethane/Urethane
Creative Material Technologies, Ltd.
Dyna-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Dampney Co., Inc.
Thurmalox
Other
Daubert Cromwell
Nox Rust 1100
Wax
Denso North America
Denso
Tape Wraps
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Organic Zinc/Epoxy/Urethane
Diamond Vogel Inc.
Mult-E-Prime 500/Multi-Thane 330 or 340
Epoxy (1-2 coats)/Urethane
Duromar, Inc.
HPL-1110/HPL-1110
Epoxy/Epoxy 100% solids
East Earth Co., Ltd.
MAXBON
Epoxy/Vinyl Ester/Vinyl Ester
ENECON Corporation
CHEMCLAD XC
Epoxy Novolac (1 or 2 Coats)
Eoncoat LLC
EonCoat 0 VOC
Other
ErgonArmor Novocoat
Novocoat RI 80
Epoxy Flake Filled/Epoxy Flake Filled
Farwest Corrosion Control Company
3M and Denso
Epoxy 100% Solids (1 or 2 Coats)
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
RUSTOP/SP-X Silicone Poly Plus
Urethane/Urethane
G.D.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Goodwest Linings and Coatings
Carboline, Sherwin-Williams, Devoe International
Organic Zinc/Epoxy/Urethane
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / CF-370 Acrylic Aliphatic Poly
Epoxy (1-2 coats)/Urethane
Hempel (USA), Inc.
AvantGuard Series/Hempadur Series/Hempathane Series
Organic Zinc/Epoxy/Urethane
Heresite Protective Coatings, LLC
Heresite CSE 6200/UCS500
Epoxy (1-2 coats)/Urethane
Highland International
Spray-Safe: 475R/68R
Epoxy (1-2 coats)/Urethane
H-I-S Coatings
H-I-S Coatings
Epoxy (1-2 coats)/Urethane
Hy-Tech Thermal Solutions
METAL SHIELD
Calcium Sulphonate
Induron Coatings, LLC
Perma-Gloss
Organic Zinc/Epoxy/Fluoropolymer
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
Insulating Coatings Corporation
Astec 2000 System
Alkyd/Acrylic/Acrylic

International Metalizing Corporation
Reddewil888
Thermal Spray
International Paint LLC
International
Inorganic Zinc/Epoxy/Siloxane
IXS Coatings/Ultimate Linings
UL XP 6613
Polyurea Pure (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps
Joton Paints Inc.
Resist 86 AV / Penguard Express / Hardtop AX
Inorganic Zinc/Epoxy/Urethane
KARNAK
502 RCW Elastomeric
Sheet Lining, Rubber
Kaufman Products, Inc.
K Pro CRS
Epoxy 100% Solids (1 or 2 Coats)
Kemper System America, Inc.
Kemperol 2K-PUR
Urethane/Urethane
Linabond
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic
Mascoat
MP-DTI
Alkyd/Acrylic/Acrylic
Maxon Technologies
CRS
Other
Micor Company, Inc.
Micorthane 6-23
Urethane/Urethane
Milamar Coatings
Milamar 6850 CS
Vinyl Ester/Vinyl Ester/Vinyl Ester
New Guard Coatings Inc.
Jotamastic/Hardtop - Amerlock/Amershield
Epoxy (1-2 coats)/Urethane
Nukote Coating Systems International
Nukote PA II
Polyurea Pure (1, 2, or 3 coats)
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy/Epoxy 100% solids
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polymer Group Ltd.
Enduracoat
Epoxy/Epoxy/Epoxy
Polyset
WB HR25® Primer/Ply-Guard AS Polyaspartic
Inorganic Zinc/Polyurea Hybrid
Polyval Coatings
Polyflex
Polyurea Pure (1, 2, or 3 coats)
PPC Coatings (MTR)
PPC Coatings
Other

PPG
Amerlock / Amercoat 450H
Epoxy (1-2 coats)/Urethane
Premier Coating Systems Inc
PCS-81111 / PCS-84300
Epoxy (1-2 coats)/Fluorourethane
Randolph Products
Randogrip Navy G
Epoxy/Epoxy
REMA Corrosion Control, Inc.
COROFLAKE
Vinyl Ester/Vinyl Ester/Vinyl Ester
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Riley Paint Company
Riley Paint
Epoxy (1-2 coats)/Urethane
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)
Sherwin-Williams
Macropoxy 646 /Acrolon 218 HS
Epoxy (1-2 coats)/Urethane
Specialty Polymer Coatings, Inc.
SP-1386
Urethane Elastomeric (1 Coat)
Specialty Products, Inc. (SPI)
PTU-UBL POLYSHIELD HT-100F UB, ElastaFLEX CR
Polyurea Pure (1, 2, or 3 coats)
Stirling Lloyd Group Plc.
Integritank
Methyl Methacrylate/Methyl Methacrylate
Synavax, Inc.
Heat Shield EPX-H20
Thermal Spray
Termarust Technologies Inc.
Termarust TR2000 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane
Textured Coatings of America
CLEAR-GARD
Epoxy (1-2 coats)/Urethane
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-GARD 255
Epoxy 100% Solids (1 or 2 Coats)
The Thortex Group
3M Scotchkote
Epoxy 100% Solids (1 or 2 Coats)
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
Tnemec Company, Inc.
Tneme-Zinc/Epoxoline/Fluonnar
Organic Zinc/Epoxy/Fluoropolymer
U.S. Coatings, LLC
MasticGrip/UreGrip
Epoxy (1-2 coats)/Urethane
US Coating Solutions
Flex-Clear
Urethane/Urethane

Valentus Specialty Chemicals
VSC
Organic Zinc/Epoxy/Urethane
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Witt Lining Systems
Spectra Blue PVC
Sheet Lining, Thermoplastic
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

LININGS FOR STEEL STORAGE TANKS & VESSELS
SOLVENTS, JET FUEL, DIESEL, GASOLINE, CRUDE OIL

3M Corrosion Protection Products
Scotchkote
Epoxy/Epoxy/Epoxy
Advanced Polymer Coatings (APC)
Chemline
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-20
Epoxy Novolac (1 or 2 Coats)
Arma Coatings
Arma 901 600
Polyurea Pure (1, 2, or 3 coats)
Atlas Minerals & Chemicals, Inc.
Chemprut
Epoxy Flake Filled/Epoxy Flake Filled
Autonomic Materials.
Ampamor Self Healing Microcapsules
Zinc-rich, organic
Axalta
Nap-Gard or Alesta
Fusion-Bonded Epoxy (1-2 coats)
Blome International
Blome
Epoxy/Epoxy Novolac/Epoxy Novolac
Bowers Industrial
Duromar
Epoxy 100% Solids (1 or 2 Coats)
Carboline Company
Phenoline
Epoxy 100% Solids (1 or 2 Coats)
Ceilcote (International Paint LLC)
Ceilcote/Flakeline
Vinyl Ester/Vinyl Ester/Vinyl Ester
Chemline Inc
Chemliner 4000
Epoxy Novolac (1 or 2 Coats)
Cloverdale Paint Inc.
ClovaLine
Epoxy Novolac (1 or 2 Coats)
CORCHEM Corporation of Texas
CORCHEM® 207
Epoxy/Epoxy 100% solids
Cortec Corporation
VpCI 395/2026
Epoxy/Epoxy Novolac/Epoxy Novolac
Cote-L Industries Inc.
durabak smooth
Urethane/Urethane
Dampney Co., Inc.
Endcor
Other

Denso North America
Archco/Denso
Vinyl Ester/Vinyl Ester/Vinyl Ester
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy Novolac (1 or 2 Coats)
Dudick, Inc.
Protecto-Flake
Vinyl Ester/Vinyl Ester/Vinyl Ester
Duromar, Inc.
HPL-2310/HPL-2310
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD XC
Epoxy Novolac (1 or 2 Coats)
Enviroline (International Paint LLC)
Enviroline
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat 0 VOC
Other
ErgonArmor Novocoat
Novocoat SC3300 Series
Epoxy Novolac (1 or 2 Coats)
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
Gemite Products Inc.
Gem-Cote EP AR
Epoxy Novolac (1 or 2 Coats)
Goodwest Linings and Coatings
Sherwin-Williams Mil-24441/29
Epoxy/Epoxy/Epoxy
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / PC-517 Cyclo-Aliphatic
Epoxy/Epoxy/Epoxy
Hempel (USA), Inc.
Hempaline Series
Epoxy 100% Solids (1 or 2 Coats)
Heresite Protective Coatings, LLC
Heresite P-403L
Other
Highland International
74-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)
Induron Coatings, LLC
PetroChem 100
Epoxy 100% Solids (1 or 2 Coats)
International Metalizing Corporation
Reddevil888
Thermal Spray
International Paint LLC
International
Epoxy 100% Solids (1 or 2 Coats)
IXS Coatings/Ultimate Linings
UL XP 6613
Polyurea Pure (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps
Jotun Paints Inc.
Tankguard Storage / Tankguard Storage
Epoxy Novolac (1 or 2 Coats)
Linabond
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic
Maxon Technologies
CRS
Other
Micor Company, Inc.
Micoline 320/47
Vinyl Ester/Vinyl Ester/Vinyl Ester
Milamar Coatings
ICO Rust Guard
Epoxy/Epoxy 100% solids
New Guard Coatings Inc.
Tankguard
Epoxy/Epoxy 100% solids
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote HCR
Polyurea Pure (1, 2, or 3 coats)
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polymer Group Ltd.
Enduracoat
Urethane/Urethane
Polyset
WB HRZS® Primer/Ply-Guard AS Polyaspartic
Inorganic Zinc/Polyurea Hybrid
Polyval Coatings
Polyflex
Polyurea Pure (1, 2, or 3 coats)
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat 68 / PSX-700
Organic Zinc/Siloxane
Premier Coating Systems Inc
PCS-#1100
Epoxy/Epoxy 100% solids
REMA Corrosion Control, Inc.
COROFLAKE
Vinyl Ester/Vinyl Ester/Vinyl Ester
Rhino Linings
Rhino Linings TuffGrip®
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)

Sherwin-Williams
Fast Clad 105 ER
Epoxy/Epoxy 100% solids
Specialty Polymer Coatings, Inc.
SP-9888
Epoxy 100% Solids (1 or 2 Coats)
Specialty Products, Inc. (SPI)
PTU-UB, POLYSHIELD HT-100F w/AE-4
Polyurea Pure (1, 2, or 3 coats)

Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-GARD 258
Epoxy/Epoxy 100% solids
The Thortex Group
3M Scotchkote
Epoxy 100% Solids (1 or 2 Coats)
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
Tnemec Company, Inc.
Tank Armor
Epoxy 100% Solids (1 or 2 Coats)
U.S. Coatings, LLC
GripLine
Epoxy Novolac (1 or 2 Coats)
US Coating Solutions
Flex-Clear
Urethane/Urethane
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Witt Lining Systems
XR-5
Sheet Lining, Thermoplastic
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

LININGS FOR STEEL STORAGE TANKS & VESSELS
ACID, OXIDIZER, ALKALI

3M Corrosion Protection Products
Scotchkote
Epoxy/Epoxy/Epoxy
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-20
Epoxy Novolac (1 or 2 Coats)
Atlas Minerals & Chemicals, Inc.
Carbo-Alkor
Brick and Tile, Acid-Resistant
Axalta
Nap-Gard or Alesta
Fusion-Bonded Epoxy (1-2 coats)
Blome International
Blome
Vinyl Ester/Vinyl Ester/Vinyl Ester
Bowers Industrial
Duromar
Epoxy 100% Solids (1 or 2 Coats)
Carboline Company
Plasite
Epoxy Novolac (1 or 2 Coats)
Ceilcote (International Paint LLC)
Ceilcote/Flakeline
Vinyl Ester/Vinyl Ester/Vinyl Ester
Chemline Inc
Chemliner 4000
Epoxy Novolac (1 or 2 Coats)
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
Cloverdale Paint Inc.
ClovaLine
Epoxy Novolac (1 or 2 Coats)
CORCHEM Corporation of Texas
CORCHEM® 243
Vinyl Ester/Vinyl Ester/Vinyl Ester
Cortec Corporation
VpCI 395/2026
Epoxy/Epoxy Novolac/Epoxy Novolac
Cote-L Industries Inc.
durabak smooth
Urethane/Urethane
Dampney Co., Inc.
Apexior
Other
Denso North America
Archco/Denso
Vinyl Ester/Vinyl Ester/Vinyl Ester
Dudick, Inc.
Protecto-Coat
Epoxy/Vinyl Ester/Vinyl Ester
Duromar, Inc.
HPL-4310/HPL-4310
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD XC
Epoxy Novolac (1 or 2 Coats)
Enviroline (International Paint LLC)
Enviroline
Epoxy Novolac (1 or 2 Coats)
ErgonArmor Novocoat
PennCoat 321 Glass Flake Lining
Vinyl Ester/Vinyl Ester/Vinyl Ester
Gemite Products Inc.
Gem-Cote EP CR
Epoxy/Epoxy 100% solids
Goodwest Linings and Coatings
Blair, Polymeric, Rubber Source
Sheet Lining, Rubber
Gulf Coast Paint Mfg., Inc.
PC-555 / PC-3500 Epoxy Novolac
Epoxy/Epoxy Novolac/Epoxy Novolac
Hempel (USA), Inc.
Hempaline Series
Epoxy 100% Solids (1 or 2 Coats)
Heresite Protective Coatings, LLC
Heresite P-403L
Other
Highland International
74-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)
Induron Coatings, LLC
PetroChem 100
Epoxy 100% Solids (1 or 2 Coats)
International Metalizing Corporation
Reddevil888
Thermal Spray
International Paint LLC
International
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
IXS Coatings/Ultimate Linings
UL XP 6613
Polyurea Pure (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps
Jotun Paints Inc.
Chemflake Special
Vinyl Ester/Vinyl Ester/Vinyl Ester
Linabond
SP Mastic Syst, Structural Polymer Syst, Simul-form
Sheet Lining, Thermoplastic
Micor Company, Inc.
Micorline 320/47
Vinyl Ester/Vinyl Ester/Vinyl Ester
Milamar Coatings
Milamar 6800 LS
Vinyl Ester/Vinyl Ester/Vinyl Ester
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote XT plus
Polyurea Hybrid (1, 2, or 3 coats)
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HR25® Primer/Ply-Guard AS Polyaspartic
Inorganic Zinc/Polyurea Hybrid
Polyval Coatings
Polyflex
Polyurea Hybrid (1, 2, or 3 coats)
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Epoxy 100% Solids (1 or 2 Coats)
Premier Coating Systems Inc
PCS-#1100
Epoxy/Epoxy 100% solids
REMA Corrosion Control, Inc.
COROFLAKE, TOPLINE
Vinyl Ester/Vinyl Ester/Vinyl Ester
Rhino Linings
Rhino Linings TuffGrip®
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Epoxy/Epoxy 100% solids
Sherwin-Williams
Nova-Plate 325
Epoxy Novolac (1 or 2 Coats)
Specialty Polymer Coatings, Inc.
SP-9888
Epoxy 100% Solids (1 or 2 Coats)
Specialty Products, Inc. (SPI)
ElastaFLEX CR
Polyurea Pure (1, 2, or 3 coats)
Stirling Lloyd Group Plc.
Permare
Other
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-GARD 255
Epoxy/Epoxy 100% solids
The Thortex Group
3M Scotchkote
Epoxy 100% Solids (1 or 2 Coats)

TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
Tnemec Company, Inc.
Tank Armor
Epoxy 100% Solids (1 or 2 Coats)
U.S. Coatings, LLC
GripLine
Vinyl Ester/Vinyl Ester/Vinyl Ester
US Coating Solutions
Flex-Clear
Urethane/Urethane
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Witt Lining Systems
Korroseal PVC
Sheet Lining, Thermoplastic
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

LININGS FOR STEEL STORAGE TANKS & VESSELS PROCESS WATER, BRINE, WASTE WATER

3M Corrosion Protection Products
Scotchkote
Epoxy/Epoxy/Epoxy
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR 5-16
Epoxy 100% Solids (1 or 2 Coats)
Arma Coatings
Arma 901 SQDS
Polyurea Pure (1, 2, or 3 coats)
Atlas Minerals & Chemicals, Inc.
Rezklad
Epoxy 100% Solids (1 or 2 Coats)
Axalta
Nap-Gard or Alesta
Fusion-Bonded Epoxy (1-2 coats)
Blome International
Blome
Vinyl Ester/Vinyl Ester/Vinyl Ester
Bowers Industrial
Duromar
Epoxy 100% Solids (1 or 2 Coats)
Carboline Company
Plasite
Epoxy Novolac (1 or 2 Coats)
Ceilcote (International Paint LLC)
Ceilcote/Flakeline
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Chemline Inc
Chemline 4200
Urethane/Urethane
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
Cloverdale Paint Inc.
ClovaLine Series
Epoxy/Epoxy 100% solids
CORCHEM Corporation of Texas
CORCHEM® 204
Epoxy/Epoxy
Cortec Corporation
VpCI-395/2026
Epoxy/Epoxy Novolac/Epoxy Novolac
Cote-L Industries Inc.
durabak smooth
Urethane/Urethane
Dampney Co., Inc.
Apexior
Other
Denso North America
Archco/Denso
Vinyl Ester/Vinyl Ester/Vinyl Ester
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy/Epoxy/Epoxy
Dudick, Inc.
Protecto-Coat
Epoxy/Vinyl Ester/Vinyl Ester
Duromar, Inc.
HPL-2510 / HPL-2510
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD SC
Epoxy 100% Solids (1 or 2 Coats)
Enviroline (International Paint LLC)
Enviroline
Epoxy Novolac (1 or 2 Coats)

Eoncoat LLC
EonCoat 0 VOC
Other

ErgonArmor Novocoat
Novocoat SP2000 Series
Epoxy Novolac (1 or 2 Coats)

Fabick, Inc. - Coatings and Sealants
Fabick
Polyurea Pure (1, 2, or 3 coats)

Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)

G.D.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic

Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)

Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)

Goodwest Linings and Coatings
Enviroline 405HT
Epoxy Novolac (1 or 2 Coats)

Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / PC-517 Cyclo-Aliphatic Epoxy
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled

Hempel (USA), Inc.
Hempaline Series
Epoxy 100% Solids (1 or 2 Coats)

Heresite Protective Coatings, LLC
Heresite P-403L
Other

Highland International
74-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)

Induron Coatings, LLC
PetroChem 100
Epoxy/Epoxy 100% solids

International Metalizing Corporation
Reddevil888
Thermal Spray

International Paint LLC
International
Epoxy 100% Solids (1 or 2 Coats)

IXS Coatings/Ultimate Linings
UL XP 661
Polyurea Pure (1, 2, or 3 coats)

Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps

Jotun Paints Inc.
Tankguard SF / Tankguard SF
Epoxy Novolac (1 or 2 Coats)

Lava-Liner
Ultra-Flex FG-300
Epoxy/Epoxy 100% solids

Linabond
SP Mastic Syst, Structural Polymer Syst, Sinsil form
Sheet Lining, Thermoplastic

Maxon Technologies
CRS
Other

Micor Company, Inc.
Micorline 320
Epoxy/Epoxy 100% solids

Milamar Coatings
Fibercoat CR
Epoxy/Epoxy Novolac/Epoxy Novolac

Normac Adhesive Products Inc.
NR-80LVHS, NR-95LVHS
Urethane/Urethane

NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy/Epoxy 100% solids

Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)

Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)

Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)

Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)

Polymer Group Ltd.
Enduracoat
Epoxy/Epoxy/Epoxy

Polyset
WB HRZS® Single Coat System
Zinc-rich, inorganic

Polyval Coatings
Polyflex
Polyurea Hybrid (1, 2, or 3 coats)

PPC Coatings (MTR)
PPC Coatings
Other

PPG
Amercoat 253
Epoxy Novolac (1 or 2 Coats)

Premier Coating Systems Inc
PCS-#1100
Epoxy/Epoxy 100% solids

REMA Corrosion Control, Inc.
COROFLAKE
Vinyl Ester/Vinyl Ester/Vinyl Ester

Rhino Linings
Rhino Extreme™ PW
Polyurea Pure (1, 2, or 3 coats)

Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)

Sherwin-Williams
Nova-Plate UHS
Epoxy/Epoxy 100% solids

Specialty Polymer Coatings, Inc.
SP-9888
Epoxy 100% Solids (1 or 2 Coats)

Specialty Products, Inc. (SPI)
ULTRA BOND-100, POLYSHIELD HT-100F W/AE-4
Polyurea Pure (1, 2, or 3 coats)

Sprayroq
SprayShield Green 2
Urethane Elastomeric (1 Coat)

Stirling Lloyd Group Plc.
Permare
Other

Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester

Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy

Thermion
Thermion
Thermal Spray

Thin Film Technology, Inc.
BIO-GARD 258
Epoxy 100% Solids (1 or 2 Coats)

The Thortex Group
3M Scotchkote
Epoxy 100% Solids (1 or 2 Coats)

TMS Metallizing Systems, Ltd.
TMS Metallizing Systems
Thermal Spray

Tnemec Company, Inc.
Tank Armor
Epoxy 100% Solids (1 or 2 Coats)

U.S. Coatings, LLC
GripLine
Epoxy Novolac (1 or 2 Coats)

US Coating Solutions
Flex-Clear
Urethane/Urethane

VersaFlex Incorporated
FSS 60 DM
Polyurea Pure (1, 2, or 3 coats)

Witt Lining Systems
Spectra Blue PVC
Sheet Lining, Thermoplastic

Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

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EXTERIOR SUPERSTRUCTURES MARINE, WEATHERING, & UV

3M Corrosion Protection Products
Scotchkote
Fusion-Bonded Epoxy (1-2 coats)

Advanced Polymer Coatings (APC)
MarineLine
Siloxane/Siloxane

APV Engineered Coatings
NeverFade(R)
Epoxy (1-2 coats)/Fluoropolymer

ARCOR - Novolac Epoxy Technologies Inc
ARCOR 1321
Epoxy 100% Solids (1 or 2 Coats)

Autonomic Materials
Amprarmor Self Healing Microcapsules
Zinc-rich, organic

Burke Industrial Coatings
Burke Liquid Stainless Steel
Epoxy Flake Filled/Epoxy Flake Filled

Carboline Company
Carbozinc/Carboguard/Carbothane
Organic Zinc/Epoxy/Urethane

Cloverdale Paint Inc.
Armourshield
Epoxy (1-2 coats)/Urethane

Coatings For Industry, Inc.
U-Series
Urethane/Urethane

Concrete Solutions by Rhino Linings
Concrete Solutions® HP Urethane
Urethane/Urethane

Cortec Corporation
VpCI 396Z/396/384
Organic Zinc/Urethane/Urethane

Cote-L Industries Inc.
durabak 18 m-26/durabak 18
Urethane/Urethane

Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)

Crossfield Products Corp.
DEX-O-TEX
Epoxy (1-2 coats)/Urethane

Dampney Co., Inc.
Epodur
Other

Daubert Cromwell
Nox-Rust 3100G
Wax

Diamond Vogel Inc.
Endura-Zinc 768/Mult-E-Prime 500/Multi-Thane 330
Organic Zinc/Epoxy/Urethane

Duromar, Inc.
HPL-1130 / HPL-1110
Epoxy 100% Solids (1 or 2 Coats)

ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)

Eoncoat LLC
EonCoat 0 VOC
Other

Farwest Corrosion Control Company
3M and Denso
Epoxy 100% Solids (1 or 2 Coats)

Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)

FSC Coatings Inc.
RUSTOP/Bio-SAFE MaxLife
Alkyd/Acrylic/Acrylic

G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic

Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)

Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)

Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / CT-370 Acrylic Aliphatic Poly
Epoxy (1-2 coats)/Urethane

Hempel (USA), Inc.
Hempadur and Hempathane Series
Epoxy (1-2 coats)/Urethane

Highland International
Spray-Safe: 325R/475R/68R
Organic Zinc/Epoxy/Urethane

Induron Coatings, LLC
Perma-Gloss
Organic Zinc/Epoxy/Fluorourethane

Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)

International Metalizing Corporation
Reddevil 888
Thermal Spray

IXS Coatings/Ultimate Linings
UL TK MH 863
Polyurea Hybrid (1, 2, or 3 coats)

Jessup Manufacturing Company
Jessup Safety Track ™
Tape Wraps

Jotun Paints Inc.
Barrier / Jotacote Universal N10 / Hardtop AX
Organic Zinc/Epoxy/Urethane

Linabond
Ureapoxy(tm)
Polyurea Hybrid (1, 2, or 3 coats)

Lonza
Copper Omadine
Other

Mascoat
MM-DTM
Alkyd/Acrylic/Acrylic

Maxon Technologies
CRS
Other

Milamar Coatings
ICO Rust Guard/PM-500
Urethane/Urethane

New Guard Coatings Inc.
Jotamastic/Hardtop - Amerlock/Amercoat
Epoxy (1-2 coats)/Urethane

Nukote Coating Systems International
Premera MAR
Other

Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)

Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)

Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane

Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)

Polyset
WB HRZS® Primer / Ply-Guard AS Polyaspartic
Inorganic Zinc/Polyurea Hybrid

PPC Coatings (MTR)
PPC Coatings
Other

PPG
AT240/AT450H
Epoxy (1-2 coats)/Urethane
Premier Coating Systems Inc
PCS-#1111 / PCS-#4300
Epoxy (1-2 coats)/Fluoropolymer
Protek Paint Ltd.
paints for pleasure boats International paints
Other
Quantum Chemical
PRECIDIUM
Organic Zinc/Polyurea Hybrid
Randolph Products
Randolph Products Randogrip Navy G
Other
Rhino Linings
Rhino Linings SolarMax®
Polyurea Pure (1, 2, or 3 coats)
Riley Paint Company
Riley Paint
Epoxy (1-2 coats)/Urethane
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
Seaguard 5000HS / Acrolon 218
Epoxy (1-2 coats)/Urethane
Specialty Polymer Coatings, Inc.
SP-1386 SP-1088
Urethane/Urethane
Specialty Products, Inc. (SPI)
ULTRA BOND-100, AMP 100, HT-100F w/AE-4
Polyurea Pure (1, 2, or 3 coats)
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Synavax, Inc.
Heat Shield PT
Thermal Spray
Termarust Technologies Inc.
Termarust TR2000 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane
ThermaCote, Inc.
ThermaCote®: Other (less than 100 g/L)
Thermion
Thermion
Thermal Spray
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
MasticGrip/UreGrip
Epoxy (1-2 coats)/Urethane
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

EXTERIOR DECK PLATE ABRASION, MARINE, WEATHERING, & UV

Advanced Polymer Coatings (APC)
MarineLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR EE-96
Epoxy 100% Solids (1 or 2 Coats)
Arma Coatings
Arma 901 & Polyaspartic
Polyurea Pure (1, 2, or 3 coats)
Autonomic Materials.
Ampamor Self Healing Microcapsules
Zinc-rich, organic
Burke Industrial Coatings
Burke Liquid Stainless Steel
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Carboline Company
Carbozinc/Carboguard/Carbothane
Organic Zinc/Epoxy/Urethane
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
Cloverdale Paint Inc.
ClovaGuard/Armourshield
Epoxy (1-2 coats)/Urethane
Coatings For Industry, Inc.
WearCOAT
Epoxy (1-2 coats)/Urethane
Concrete Solutions by Rhino Linings
Concrete Solutions® HP Urethane
Urethane/Urethane
Cote-L Industries Inc.
durabak18m-28/durabak18m-26 smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Crossfield Products Corp.
DEX-O-TEX
Epoxy (1-2 coats)/Urethane
Denso North America
Denso
Polyester/Polyester/Polyester
Diamond Vogel Inc.
Multi-E-Poxy 180/Multi-Thane 330
Epoxy (1-2 coats)/Urethane
Duromar, Inc.
HPL-2221-UV / HPL-2221-UV
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat 0 VOC
Other
Farwest Corrosion Control Company
3M and Denso
Epoxy 100% Solids (1 or 2 Coats)
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
RUSTOP 6000 System
Urethane/Urethane
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Fibre-Prime
Other
Global EcoTechnologies
ENDURA-TUF
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / CM-15 Epoxy Mastic
Epoxy/Epoxy
Hempel (USA), Inc.
Hempadur and Hempathane Series
Epoxy (1-2 coats)/Urethane
Induron Coatings, LLC
Perma-Tuff SL
Epoxy 100% Solids (1 or 2 Coats)
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
IX5 Coatings/Ultimate Linings
UL TK MH 863
Polyurea Hybrid (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps
Jotun Paints Inc.
Barrier / Jotacote Universal N10 / Hardtop AX
Organic Zinc/Epoxy/Urethane
Key Resin Company/Flowcrete
Evonik/Degadur
Methyl Methacrylate/Methyl Methacrylate
Linabond
Ureapoxy(tm)
Polyurea Hybrid (1, 2, or 3 coats)
Maxon Technologies
CRS
Other
Milamar Coatings
Fibercoat/PM-500
Epoxy/MCU/MCU
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-80LVHS
Urethane/Urethane
Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HR25® Primer / Ply-Guard AS Polyaspartic
Inorganic Zinc/Polyurea Hybrid
Polyval Coatings
Polyur
Urethane/Urethane
PPC Coatings (MTR)
PPC Coatings
Other

PPG
AT235/AT237M
Epoxy/Epoxy 100% solids
Premier Coating Systems Inc
PCS-#1200-TA
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Randolph Products
Randolph Products Randogrip Navy G
Other
Rhino Linings
Rhino Linings SolarMax®
Polyurea Pure (1, 2, or 3 coats)
Riley Paint Company
Riley Paint
Epoxy (1-2 coats)/Urethane
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
Seaguard 5000HS / Acrolon 218
Epoxy (1-2 coats)/Urethane
Specialty Polymer Coatings, Inc.
SP-1386 SP-1088
Urethane/Urethane
Specialty Products, Inc. (SPI)
Polyshield HT-100F UB, HT-5L UB, R5 UB
Polyurea Pure (1, 2, or 3 coats)
SpeedCove Inc. DBA Solid Rock Enterprises
SpeedCove Precast Cove Base Systems
Other
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Synavax, Inc.
Heat Shield PT
Thermal Spray
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane
ThermaCote, Inc.
ThermaCote®: Other (less than 100 g/L)
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-GARD 258
Epoxy/Epoxy 100% solids
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

INTERIOR MILD

Advanced Polymer Coatings (APC)
MarineLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR 1321
Epoxy 100% Solids (1 or 2 Coats)
Arma Coatings
Arma 901 50DS
Polyurea Pure (1, 2, or 3 coats)
Burke Industrial Coatings
Burke Liquid Stainless Steel
Epoxy Flake Filled/Epoxy Flake Filled
Carboline Company
Carboguard/Carbothane
Epoxy (1-2 coats)/Urethane
Cloverdale Paint Inc.
ClovaGuard
Epoxy/Epoxy/Epoxy
Coatings For Industry, Inc.
U-Series
Epoxy/Epoxy
Concrete Solutions by Rhino Linings
Concrete Solutions® HP Urethane
Urethane/Urethane
Cortec Corporation
VpCI 386
Alkyd/Acrylic/Acrylic
Cote-L Industries Inc.
durabak m-26/durabak m-26 smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Crossfield Products Corp.
DEX-O-TEX
Epoxy/Epoxy/Epoxy
Dampney Co., Inc.
Thurmalox
Other
Daubert Cromwell
Nox Rust 3100G
Wax

MARINE INDUSTRY

Denso North America
Denso
Polyester/Polyester/Polyester
Diamond Vogel Inc.
Iron Prime 600/Finium DTM-AT
Alkyd/Acrylic/Acrylic
Duromar, Inc.
HPL-1110 / HPL-1110
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
ENESEAL CR
Other
Eoncoat LLC
EonCoat 0 VOC
Other
ErgonArmor Novocoat
Novocoat RI 80
Epoxy/Epoxy 100% solids
Farwest Corrosion Control Company
3M and Denso
Epoxy/Epoxy 100% solids
Flexcrete Technologies Ltd
Compratec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
RUSTOP/Bio-SAFE MaxLife
Alkyd/Acrylic/Acrylic
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / CM-15 Epoxy Mastic
Epoxy/Epoxy
Hempel (USA), Inc.
Hempalin Series or Hempadur Series
Alkyd/Alkyd/Alkyd
Heresite Protective Coatings, LLC
VR-500
Other
Highland International
67-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)
Hy-Tech Thermal Solutions
METAL SHIELD
Calcium Sulphonate
Induron Coatings, LLC
Perma-Clean II
Epoxy/Epoxy/Epoxy
International Metalizing Corporation
Reddevil 888
Thermal Spray
IXS Coatings/Ultimate Linings
UL TK MH 863
Polyurea Hybrid (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps
Jotun Paints Inc.
Pilot QD Primer / Pilot II / Pilot II
Alkyd/Alkyd/Alkyd
Key Resin Company/Flowcrete
Key Lastic ME
Epoxy/Epoxy 100% solids
Mascoat
MM-DTM
Alkyd/Acrylic/Acrylic
Maxon Technologies
CRS
Other
Milamar Coatings
ICO Rust Guard/ICO Glaze
Epoxy/Epoxy 100% solids
New Guard Coatings Inc.
Jotun/PPG/Guard
Alkyd/Alkyd/Alkyd
Normac Adhesive Products Inc.
NR-80LVHS, NR-95LVHS
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote PA II
Polyurea Pure (1, 2, or 3 coats)
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Plastic Maritime Corporation
Weurlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HRZS® Primer / Ply-Guard AS Polyaspartic
Inorganic Zinc/Polyurea Hybrid
Polyval Coatings
Polyflex
Polyurea Hybrid (1, 2, or 3 coats)
PPC Coatings (MTR)
PPC Coatings
Other
PPG
AT185H/AT5450
Alkyd/Alkyd/Alkyd
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Riley Paint Company
Riley Paint
Alkyd/Alkyd/Alkyd
Royal Chemical Corp.
Royal Void Kote
Coal Tar/Asphalt
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
Seaguard 1000 Enamel
Alkyd/Alkyd/Alkyd
Specialty Polymer Coatings, Inc.
SP-5885
Epoxy (1-2 coats)/Urethane
Specialty Products, Inc. (SPI)
POLYSHIELD HT-100F UB, AMP 100, ElastaFLEX HP
Polyurea Pure (1, 2, or 3 coats)
SpeedCove Inc. DBA Solid Rock Enterprises
SpeedCove Precast Cove Base Systems
Other
Sprayroq
SprayShield Green 2
Urethane Elastomeric (1 Coat)
Synavax, Inc.
Heat Shield PT
Thermal Spray
Termarust Technologies Inc.
Termarust TR2100 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
ThermaCote, Inc.
ThermaCote®: Other (less than 100 g/L)
Thermion
Thermion
Thermal Spray
U.S. Coatings, LLC
MultiGrip
Alkyd/Alkyd/Alkyd
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

BELOW WATER LINE

3M Corrosion Protection Products
Scotchkote
Fusion-Bonded Epoxy (1-2 coats)
Advanced Polymer Coatings (APC)
MarineLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-20
Epoxy Novolac (1 or 2 Coats)
BASF Corporation–Construction Systems
MasterBrace 6000 UW
Epoxy/Epoxy 100% solids
Carboline Company
Bitumastic
Epoxy Coal Tar/Epoxy Coal Tar
ChemCo Systems
CCS Marine Coating
Epoxy/Epoxy 100% solids
Chemline Inc
Chemline ARC
Polyurea Pure (1, 2, or 3 coats)
Cloverdale Paint Inc.
Clovamastic
Epoxy/Epoxy
Cortec Corporation
VpCI 396Z/395/395
Organic Zinc/Epoxy/Epoxy
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Denso North America
SeaShield/Denso
Other
Diamond Vogel Inc.
Mult-E-Poxy 180
Epoxy/Epoxy/Epoxy
Duromar, Inc.
HPL-2510 / HPL-2510-FR
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat 0 VOC
Other
ErgonArmor Novocoat
Novocoat SP2000 Series
Epoxy/Epoxy 100% solids
Farwest Corrosion Control Company
Trenton
Tape Wraps

Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Fibre-Prime
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Hempel (USA), Inc.
Hempadur Series and Fouling Control Products
Other
Induron Coatings, LLC
PermaSafe 100 Ceramic Epoxy
Epoxy 100% Solids (1 or 2 Coats)
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
IXS Coatings/Ultimate Linings
UL TK MH 863
Polyurea Hybrid (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track™
Tape Wraps
Jotun Paints Inc.
Jotamastic 90 Al / Jotamastic 90
Epoxy/Epoxy
Kaufman Products, Inc.
SurePoxy HMLV
Other
Linabond
Ureapoxy(tm)
Polyurea Hybrid (1, 2, or 3 coats)
Lonza
Copper Omadine
Other
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Guard
Epoxy Coal Tar/Epoxy Coal Tar
Normac Adhesive Products Inc.
NR-80LVHS, NR-95LVHS
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Polyurea Hybrid (1, 2, or 3 coats)
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HRZS* Single Coat System
Zinc-rich, inorganic
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Epoxy/Epoxy/Epoxy
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
Fast Clad ER
Epoxy 100% Solids (1 or 2 Coats)
Specialty Polymer Coatings, Inc.
SP-1864
Urethane Elastomeric (1 Coat)
Specialty Products, Inc. (SPI)
POLYSHIELD HT, POLYSHIELD HT-100F UB, Aqua seal Hi RI
Polyurea Pure (1, 2, or 3 coats)
Sprayroq
SprayWall
Urethane/Urethane
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
MasticGrip
Epoxy Coal Tar High Build (1 or 2 Coats)
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

BALLAST TANK LININGS

Advanced Polymer Coatings (APC)
MarinLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-15
Epoxy 100% Solids (1 or 2 Coats)
Arma Coatings
Arma 901 SS
Polyurea Pure (1, 2, or 3 coats)
Carboline Company
Carboguard
Epoxy/Epoxy/Epoxy
Cloverdale Paint Inc.
Clovamastic
Epoxy/Epoxy
CORCHEM Corporation of Texas
CORCHEM® 207
Epoxy 100% Solids (1 or 2 Coats)
Cortec Corporation
VpCI 396Z/395/395
Organic Zinc/Epoxy/Epoxy
Cote-L Industries Inc.
durabak m-26 smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Denso North America
Denso
Other
Duromar, Inc.
HPL-2510/ HPL-2510
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat 0 VOC
Other
ErgonArmor Novocoat
Novocoat SP2000 Series
Epoxy/Epoxy 100% solids
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
PC-517 Cyclo-Aliphatic Epoxy
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Hempel (USA), Inc.
Hempadur Series
Epoxy/Epoxy
Heresite Protective Coatings, LLC
CSE-6200
Epoxy/Epoxy/Epoxy
Induron Coatings, LLC
PermaSafe 100 Ceramic Epoxy
Epoxy/Epoxy 100% solids
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
IXS Coatings/Ultimate Linings
UL TK MH 863
Polyurea Hybrid (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track™
Tape Wraps
Jotun Paints Inc.
Jotacote Universal N10 / Jotacote Universal N10
Epoxy/Epoxy
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-80LVHS, NR-95LVHS
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)

Peerless Industrial Systems
epigen
Epoxy/Epoxy 100% solids
Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HR25® Single Coat System
Zinc-rich, inorganic
Polyval Coatings
Polyflex
Polyurea Pure (1, 2, or 3 coats)
PPC Coatings (MTR)
PPC Coatings
Other

PPG
AT240/AT240
Epoxy/Epoxy/Epoxy
Premier Coating Systems Inc
PCS-#1100
Epoxy/Epoxy 100% solids
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Royal Chemical Corp.
Royal Easy Kote
Coal Tar/Asphalt
Sauereisen, Inc.
Sauereisen
Urethane/Urethane

Sherwin-Williams
Fast Clad ER
Epoxy 100% Solids (1 or 2 Coats)
Specialty Polymer Coatings, Inc.
SP-7888 NSF
Epoxy 100% Solids (1 or 2 Coats)
Specialty Products, Inc. (SPI)
POLYSHIELD HT, POLYSHIELD HT-100F UB, PTU UB
Polyurea Pure (1, 2, or 3 coats)
Stirling Lloyd Group Plc.
Permare
Other
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Termarust Technologies Inc.
Termarust TR2000 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-DUR 560
Epoxy/Epoxy 100% solids
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
EpoxyGrip
Epoxy/Epoxy/Epoxy
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

CARGO TANK LININGS

Advanced Polymer Coatings (APC)
MarineLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-20
Epoxy Novolac (1 or 2 Coats)
Arma Coatings
Arma 901 55
Polyurea Pure (1, 2, or 3 coats)
Carboline Company
Phenoline
Epoxy 100% Solids (1 or 2 Coats)
Cloverdale Paint Inc.
ClovaLine
Epoxy 100% Solids (1 or 2 Coats)
CORCHEM Corporation of Texas
CORCHEM® 252
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Cortec Corporation
VpCI 396Z/395/395
Organic Zinc/Epoxy/Epoxy
Cote-L Industries Inc.
durabak m-26 smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Denso North America
Denso
Other
Duromar, Inc.
HPL-2510 / HPL-2510
Epoxy (1-2 coats)/Urethane
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat 0 VOC
Other
ErgonArmor Novocoat
Penncoat 401, Silicon nanoparticle
Other
Fabick, Inc. - Coatings and Sealants
Fabick
Polyurea Pure (1, 2, or 3 coats)
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Gem-Cote EP CR
Epoxy 100% Solids (1 or 2 Coats)
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
PC-517 Cyclo-Aliphatic Epoxy
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Hempel (USA), Inc.
Hempadur Series
Epoxy Novolac (1 or 2 Coats)
Heresite Protective Coatings, LLC
CSE-6200
Epoxy/Epoxy/Epoxy
Highland International
T4-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)
Induron Coatings, LLC
PermaClean 100 Ceramic Epoxy
Epoxy 100% Solids (1 or 2 Coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
IX5 Coatings/Ultimate Linings
UL TK MH 863
Polyurea Hybrid (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track *
Tape Wraps
Jotun Paints Inc.
Tankguard Series
Epoxy Novolac (1 or 2 Coats)
Linabond
Ureapoxy(tm)
Polyurea Hybrid (1, 2, or 3 coats)
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-801VHS, NR-951VHS
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Polyurea Hybrid (1, 2, or 3 coats)
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HR25® Single Coat System
Zinc-rich, inorganic
Polyval Coatings
Polyflex
Polyurea Pure (1, 2, or 3 coats)
PPC Coatings (MTR)
PPC Coatings
Other
PPG
AT253/AT253
Epoxy Novolac (1 or 2 Coats)

Rhino Linings
Rhino Linings TuffGrip®
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
Phenicon HS
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
Specialty Polymer Coatings, Inc.
SP-1386
Urethane Elastomeric (1 Coat)
Specialty Products, Inc. (SPI)
ULTRA BOND-100, POLYSHIELD HT-100F UB, PTU UB
Polyurea Pure (1, 2, or 3 coats)
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-DUR 560
Epoxy/Epoxy 100% solids
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
GripLine
Epoxy/Epoxy 100% solids
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

CARGO HOLD LININGS

Advanced Polymer Coatings (APC)
MarineLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-20
Epoxy Novolac (1 or 2 Coats)
Arma Coatings
Arma 901 98AS
Polyurea Pure (1, 2, or 3 coats)
Carboline Company
Carboguard
Epoxy/Epoxy/Epoxy
Cloverdale Paint Inc.
ClovaLine
Epoxy Novolac (1 or 2 Coats)
CORCHEM Corporation of Texas
CORCHEM® 258
Inorganic Zinc/Epoxy Novolac/Epoxy Novolac
Cortec Corporation
VpCI 396Z/195/395
Organic Zinc/Epoxy/Epoxy
Cote-L Industries Inc.
durabak m-26 smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Denso North America
Denso
Other
Diamond Vogel Inc.
Mult-E-Prime 500/Mult-E-Poxy 180
Epoxy/Epoxy/Epoxy
Duromar, Inc.
HPL-1110 / HPL-1110
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat 0 VOC
Other
ErgonArmor Novocoat
Novocoat SC3300 Series
Epoxy Novolac (1 or 2 Coats)
Fabick, Inc. - Coatings and Sealants
Fabick
Polyurea Pure (1, 2, or 3 coats)
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
PC-517 Cyclo-Aliphatic Epoxy
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Hempel (USA), Inc.
Hempadur Series
Epoxy/Epoxy
Heresite Protective Coatings, LLC
CSE-6200
Epoxy/Epoxy/Epoxy
Highland International
74-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)
Induron Coatings, LLC
PermaClean 100 Ceramic Epoxy
Epoxy 100% Solids (1 or 2 Coats)
Industrial Solutions USA, LLC.
Polycoat
Urethane Elastomeric (1 Coat)
International Metalizing Corporation
Reddevil 888
Thermal Spray
IXS Coatings/Ultimate Linings
ULTK MH 863
Polyurea Hybrid (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps
Jotun Paints Inc.
Jotaguard 630/660/690
Epoxy/Epoxy/Epoxy
Linabond
Uneapoxy(tm)
Polyurea Hybrid (1, 2, or 3 coats)
Mascoat
MM-DTM
Alkyd/Acrylic/Acrylic
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-80LVHS, NR-95LVHS
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Polyurea Hybrid (1, 2, or 3 coats)
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HR25® Single Coat System
Zinc-rich, inorganic
Polyval Coatings
Polyflex
Polyurea Hybrid (1, 2, or 3 coats)
PPC Coatings (MTR)
PPC Coatings
Other
PPG
AT238/AT238
Epoxy/Epoxy/Siloxane
Rhino Linings
Rhino Linings TuffGrip®
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
DuraPlate 301
Epoxy/Epoxy 100% solids
Specialty Polymer Coatings, Inc.
SP-1386
Urethane Elastomeric (1 Coat)
Specialty Products, Inc. (SPI)
PTU UB,POLYSHIELD HT-100F UB, AMP 100
Polyurea Pure (1, 2, or 3 coats)
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Synavax, Inc.
Heat Shield PT
Thermal Spray
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-DUR 560
Epoxy/Epoxy 100% solids
U.S. Coatings, LLC
EpoxyGrip
Epoxy/Epoxy/Epoxy
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC Zero-VOC Galvanizing Compound
Zinc-rich, inorganic

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JACKET IMMERSED AREA

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane

BASF Corporation–Construction Systems
MasterBrace 6000
Epoxy/Epoxy 100% solids

Burke Industrial Coatings
Burke Liquid Stainless Steel
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled

Carboline Company
Phenoline
Epoxy 100% Solids (1 or 2 Coats)

ChemCo Systems
CCS Marine Coating
Organic Zinc/Epoxy 100% solids

Cortec Corporation
VpCI 396Z/395/395
Organic Zinc/Epoxy/Epoxy

Cote-L Industries Inc.
Durabak/durabak smooth
Urethane/Urethane

Daubert Cromwell
Nox-Rust-310OG
Wax

Denso North America
SeaShield/Denso
Other

Duromar, Inc.
HPL-2510 / HPL-2510-FR
Epoxy 100% Solids (1 or 2 Coats)

Eoncoat LLC
EonCoat 0 VOC
Other

ErgonArmor Novocoat
R810
Epoxy 100% Solids (1 or 2 Coats)

Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)

G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic

Gemite Products Inc.
Fibre-Prime
Other

Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)

Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / CM-15 Epoxy Mastic
Epoxy/Epoxy/Epoxy

Hempel (USA), Inc.
Quattro Series
Epoxy/Epoxy/Epoxy

Heresite Protective Coatings, LLC
CSE-6200/UC-5100
Epoxy (1-2 coats)/Urethane

International Metalizing Corporation
Reddevil 888
Thermal Spray

International Paint LLC
International
Epoxy/Epoxy/Epoxy

IXS Coatings/Ultimate Linings
UL AL 661)
Polyurea Pure (1, 2, or 3 coats)

Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps

Jotun Paints Inc.
Marathon 1000 GF / Marathon 1000 GF
Epoxy Flake Filled/Epoxy Flake Filled

Kaufman Products, Inc.
K Pro UC Coating
Epoxy 100% Solids (1 or 2 Coats)

Linabond
Unepoxy(tm)
Polyurea Hybrid (1, 2, or 3 coats)

New Guard Coatings Inc.
Jotun/PPG
Other

NSP Specialty Products
NSP-120 HPEC High Build
Epoxy 100% Solids (1 or 2 Coats)

Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)

Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)

Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane

Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)

Polyguard Products, Inc.
Polyguard RD-6
Tape Wraps

Polyset
WB HRZS® Single Coat System
Zinc-rich, inorganic

PPC Coatings (MTR)
PPC Coatings
Other

PPG
Amercoat
Epoxy Novolac (1 or 2 Coats)

Rhino Linings
Rhino Linings TuffGrip®
Urethane Elastomeric (1 Coat)

Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)

Sherwin-Williams
Fast Clad ER
Epoxy/Epoxy 100% solids

Specialty Products, Inc. (SPI)
ULTRA BOND-100, POLYSHIELD HT-100F UB,
POLYSHIELD HT
Polyurea Pure (1, 2, or 3 coats)

Subsea Industries NV
Ecolock
Vinyl Ester/Vinyl Ester/Vinyl Ester

Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy

Thermion
Thermion
Thermal Spray

Thin Film Technology, Inc.
BIO-DUR 560
Epoxy 100% Solids (1 or 2 Coats)

TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray

U.S. Coatings, LLC
GripLine
Epoxy/Epoxy 100% solids

Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

JACKET SPLASH ZONE

AcryliCon Flooring Solutions
AcryliCon Industry
Other

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane

BASF Corporation–Construction Systems
MasterBrace 6000
Epoxy/Epoxy 100% solids

Blome International
Blome EC-86
Epoxy/Epoxy/Epoxy

Burke Industrial Coatings
Burke Liquid Stainless Steel
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled

Carboline Company
Carboguard
Epoxy Flake Filled/Epoxy Flake Filled

ChemCo Systems
CCS Marine Coating HB
Epoxy 100% Solids (1 or 2 Coats)

Cortec Corporation
VpCI 396Z/395/395
Organic Zinc/Epoxy/Epoxy

Cote-L Industries Inc.
Durabak/durabak smooth
Urethane/Urethane

Daubert Cromwell
Nox-Rust-3100G
Wax

Denso North America
SeaShield/Denso
Other

Duromar, Inc.
HPL-2510 / HPL-2510-FR
Epoxy 100% Solids (1 or 2 Coats)

ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)

Eoncoat LLC
EonCoat 0 VOC
Other

Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)

G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic

Gemite Products Inc.
Fibre-Prime
Other

Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)

Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / CM-15 Epoxy Mastic
Epoxy/Epoxy

Hempel (USA), Inc.
Quattro Series/Hempadur Series
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled

Heresite Protective Coatings, LLC
CSE-6200
Epoxy/Epoxy/Epoxy

International Metalizing Corporation
Reddevil 888
Thermal Spray

International Paint LLC
International
Epoxy/Epoxy/Epoxy

IXS Coatings/Ultimate Linings
UL AL 6613
Polyurea Pure (1, 2, or 3 coats)

Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps

Jotun Paints Inc.
Marathon 1000 GF / Marathon 1000 GF
Epoxy Flake Filled/Epoxy Flake Filled

Kaufman Products, Inc.
K Pro UC Coating
Epoxy 100% Solids (1 or 2 Coats)

Linabond
Ureapoxy(tm)
Polyurea Hybrid (1, 2, or 3 coats)

Maxon Technologies
CRS
Other

New Guard Coatings Inc.
Jotun/PPG
Other

NSP Specialty Products
NSP-120 HPEC High Build
Epoxy 100% Solids (1 or 2 Coats)

Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HRZS® Single Coat System
Zinc-rich, inorganic
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Epoxy 100% Solids (1 or 2 Coats)
Premier Coating Systems Inc
PCS-#12007A
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Randolph Products
Randogrip Navy G
Other
Rhino Linings
Rhino Linings TuffGrip®
Urethane Elastomeric (1 Coat)
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)
Sherwin-Williams
Sher-Glass FF
Epoxy Flake Filled/Epoxy Flake Filled
Specialty Products, Inc. (SPI)
POLYSHIELD HT-100F UB, HT-SL UB, PTU
Polyurea Pure (1, 2, or 3 coats)
Subsea Industries NV
Ecolock
Vinyl Ester/Vinyl Ester/Vinyl Ester
Synavax, Inc.
Heat Shield PT
Thermal Spray
Termarust Technologies Inc.
Termarust TR2000 HR CSA series;
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-DUR 560
Epoxy/Epoxy 100% solids
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
GripLine
Epoxy/Epoxy 100% solids
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

JACKET
ATMOSPHERIC ZONE

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
Burke Industrial Coatings
Burke Liquid Stainless Steel
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Carboline Company
Carbozinc/Carboguard/Carbothane
Inorganic Zinc/Epoxy/Urethane
Cortec Corporation
VpCI 396Z/396/384
Organic Zinc/Urethane/Urethane
Cote-L Industries Inc.
Durabak/durabak smooth
Urethane/Urethane
Daubert Cromwell
Nox-Rust-1100G
Wax
Denso North America
SeaShield/Denso
Other
Duromar, Inc.
HPL-1110 / HPL-1110
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat 0 VOC
Other
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
RUSTOP/SP-X Silicone Poly Plus
Epoxy (1-2 coats)/Urethane
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Fibre-Prime
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / CM-15 Epoxy Mastic
Epoxy/Epoxy
Hempel (USA), Inc.
Quattro Series/Hempathane Series
Organic Zinc/Epoxy/Siloxane
Heresite Protective Coatings, LLC
VR-500
Other
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
International
Epoxy/Epoxy/Epoxy
IXS Coatings/Ultimate Linings
UL AL 6613
Polyurea Pure (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps
Jotun Paints Inc.
Jotamastic AL / Jotamastic 90 / Hardtop AX
Epoxy (1-2 coats)/Urethane
Kaufman Products, Inc.
K Pro UC Coating
Epoxy 100% Solids (1 or 2 Coats)
Linabond
Ureapoxy(tm)
Polyurea Hybrid (1, 2, or 3 coats)
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Jotun/PPG
Other
NSP Specialty Products
NSP-120 HPEC High Build
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote PA II
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HRZS® Single Coat System
Zinc-rich, inorganic
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Inorganic Zinc/Epoxy/Urethane
Randolph Products
Randogrip Navy G
Other
Rhino Linings
Rhino Linings TuffGrip®
Urethane Elastomeric (1 Coat)
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)
Sherwin-Williams
Dura-Plate UHS
Epoxy/Epoxy 100% solids
Specialty Products, Inc. (SPI)
ULTRA BOND-100, AMP-100 w/ AE-4, POLY SHIELD HT-100F
Polyurea Pure (1, 2, or 3 coats)
Subsea Industries NV
Ecolock
Vinyl Ester/Vinyl Ester/Vinyl Ester
Synavax, Inc.
Heat Shield PT
Thermal Spray
Termarust Technologies Inc.
Termarust TR2000 HR CSA series;
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane

Thermion
Thermion
Thermal Spray
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
ZincGard/GripLine
Organic Zinc/Epoxy 100% solids
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

TOPSIDES
SEVERE MARINE EXPOSURE

AcryliCon Flooring Solutions
AcryliCon Industry
Other
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR 1121
Epoxy 100% Solids (1 or 2 Coats)
Arma Coatings
Arma 901 & Arma Polyaspartic
Polyurea Pure (1, 2, or 3 coats)
Autonomic Materials.
Amparmor Self Healing Microcapsules
Zinc-rich, organic
Burke Industrial Coatings
Burke Liquid Stainless Steel
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Carboline Company
Carbozinc/Carboguard/Carbothane
Organic Zinc/Epoxy/Urethane
Coatings For Industry, Inc.
U-Series
MCU Zinc Rich/Urethane/Urethane
Cortec Corporation
VpCI 396Z/396/384
Organic Zinc/Urethane/Urethane
Cote-L Industries Inc.
Durabak18/durabak18 smooth
Urethane/Urethane
Denso North America
Denso
Polyester/Polyester/Polyester
Duromar, Inc.
HPL-2510 / HPL-2510
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat 0 VOC
Other
ErgonArmor Novocoat
R180
Epoxy 100% Solids (1 or 2 Coats)
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
RUSTOP/SP-X Silicone Poly Plus
Epoxy (1-2 coats)/Urethane
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / PC-517 Cyclo-Aliphatic Epoxy
Epoxy/Epoxy/Epoxy
Hempel (USA), Inc.
AvantGuard Series/Quattro Series/Hempaxane
Epoxy/Epoxy/Siloxane
Heresite Protective Coatings, LLC
CSE-6200/UC-5500
Epoxy (1-2 coats)/Urethane
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
International
Inorganic Zinc/Epoxy/Siloxane
IXS Coatings/Ultimate Linings
UL AL 6613
Polyurea Pure (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps
Jotun Paints Inc.
Barrier / Jotacote Universal N10 / Hardtop AX
Organic Zinc/Epoxy/Urethane
Kaufman Products, Inc.
K Pro UC Coating
Epoxy 100% Solids (1 or 2 Coats)
Linahood
Ureapoxy(tm)
Polyurea Hybrid (1, 2, or 3 coats)
Mascoat
MM-DTM
Alkyd/Acrylic/Acrylic
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-80LVHS, NR-95LVHS
Urethane/Urethane
NSP Specialty Products
NSP-120 HPEC High Build
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote PA II
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HR2S® Primer + Ply-Guard PSC8 Polysilox
and
Inorganic Zinc/Epoxy/Siloxane
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Organic Zinc/Siloxane
Premier Coating Systems Inc
PCS-#1111 / PCS-#4300
Epoxy (1-2 coats)/Fluorourethane
Randolph Products
Randogrip Navy G
Other
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)

Sherwin-Williams
Dura-Plate 301/Acrolon 218 HS
Epoxy (1-2 coats)/Urethane
Specialty Products, Inc. (SPI)
XS, ULTRA BOND-100, AMP 100,HT-100F w/AE-4
Polyurea Pure (1, 2, or 3 coats)
SpeedCove Inc. DBA Solid Rock Enterprises
SpeedCove Precast Cove Base Systems
Other
Subsea Industries NV
Ecolock
Vinyl Ester/Vinyl Ester/Vinyl Ester
Synavax, Inc.
Heat Shield High Heat
Thermal Spray
Termarust Technologies Inc.
Termarust TR2000 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-DUR 560
Epoxy 100% Solids (1 or 2 Coats)
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
ZincGard/EpoxyGrip/UreGrip
Inorganic Zinc/Epoxy/Urethane
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC Zero-VOC Galvanizing Compound
Zinc-rich, inorganic

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CHEMICAL/WATER EXPOSURE - CAUSTIC OR ACID

3L&T Inc.
CorrosionGard-1605
Other

3M Corrosion Protection Products
Scotchkote
Epoxy/Epoxy/Epoxy

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane

ARCOR - Novolac Epoxy Technologies Inc
ARCOR 5-20
Epoxy Novolac (1 or 2 Coats)

Atlas Minerals & Chemicals, Inc.
Carbo-Alkor
Brick and Tile, Acid-Resistant

Biome International
Biome
Epoxy/Epoxy Novolac/Epoxy Novolac

Bowers Industrial
Duromar
Epoxy 100% Solids (1 or 2 Coats)

Burke Industrial Coatings
Burke Liquid Stainless Steel
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled

Carboline Company
Plasite/Phenoline
Epoxy 100% Solids (1 or 2 Coats)

Ceilcote (International Paint LLC)
Ceilcote/Flakeline
Vinyl Ester/Vinyl Ester/Vinyl Ester

CIM Industries
CIM
Urethane Elastomeric (1 Coat)

Cloverdale Paint Inc.
Clovaline
Epoxy Novolac (1 or 2 Coats)

Coatings For Industry, Inc.
WearCOAT
Epoxy/Epoxy Novolac/Epoxy Novolac

Cortec Corporation
VpCI-396Z/395/2026
Organic Zinc/Epoxy Novolac/Epoxy Novolac

Crossfield Products Corp.
DEX-O-TEX
Epoxy Novolac (1 or 2 Coats)

Daubert Cromwell
Nox-Rust-410I
Wax

Denso North America
Denso
Vinyl Ester/Vinyl Ester/Vinyl Ester

Diamond Vogel Inc.
Mult-E-Prime 500/Multi-Thane 310 or 340
Epoxy (1-2 coats)/Urethane

Dudick, Inc.
Protecto-Flake
Epoxy/Vinyl Ester/Vinyl Ester

Duromar, Inc.
HPL-4310 / HPL-4310
Epoxy 100% Solids (1 or 2 Coats)

ENECON Corporation
CHEMCLAD XC
Epoxy Novolac (1 or 2 Coats)

Enviroline (International Paint LLC)
Enviroline
Epoxy Novolac (1 or 2 Coats)

Eoncoat LLC
EonCoat
Other

ErgonArmor Novocoat
Novocoat SC3300 Series
Epoxy Novolac (1 or 2 Coats)

FSC Coatings Inc.
RUSTOP/SP-X Silicone Poly Plus
Epoxy (1-2 coats)/Urethane

Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)

Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)

Goodwest Linings and Coatings
Blair Polymeric, Rubber Source
Sheet Lining, Rubber

Gulf Coast Paint Mfg., Inc.
PC-517 Cycio-Aliphatic Epoxy Mastic
Epoxy/Epoxy/Epoxy

Hempel (USA), Inc.
Hempaline Series
Epoxy 100% Solids (1 or 2 Coats)

Heresite Protective Coatings, LLC
Heresite
Other

Highland International
74-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)

Induron Coatings, LLC
PermaSafe 100 Ceramic Epoxy
Epoxy 100% Solids (1 or 2 Coats)

Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)

International Metalizing Corporation
Reddevil 888
Thermal Spray

International Paint LLC
International
Epoxy Novolac (1 or 2 Coats)

IXS Coatings/Ultimate Linings
UL XP 6613
Polyurea Pure (1, 2, or 3 coats)

Jotun Paints Inc.
Chemflake Special
Vinyl Ester/Vinyl Ester/Vinyl Ester

Micor Company, Inc.
Micorox 145
Epoxy/Epoxy Novolac/Epoxy Novolac

Milamar Coatings
ICD Rust Guard/PM-500
Epoxy/Epoxy Novolac/Epoxy Novolac

New Guard Coatings Inc.
Jotun/PPG
Other

Normac Adhesive Products Inc.
NR-80LVHS, NR-95LVHS
Urethane/Urethane

NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)

Nukote Coating Systems International
Nukote XT Plus
Polyurea Hybrid (1, 2, or 3 coats)

Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)

Peerless Industrial Systems
epigen chemproof
Epoxy/Epoxy Novolac/Epoxy Novolac

Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)

Polyset
Ply-Guard UR Polyurea
Polyurea Pure (1, 2, or 3 coats)

PPC Coatings (MTR)
PPC Coatings
Other

PPG
Amercoat
Epoxy 100% Solids (1 or 2 Coats)
Randolph Products
Randolph Products RP 250LV
Other
REMA Corrosion Control, Inc.
COROFLAKE
Vinyl Ester/Vinyl Ester/Vinyl Ester
Rhino Linings
Rhino HiChem™
Polyurea Hybrid (1, 2, or 3 coats)
Riley Paint Company
Riley Paint
Epoxy (1-2 coats)/Urethane
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)
Sherwin-Williams
ExpressCote 150
Epoxy/Epoxy
Specialty Polymer Coatings, Inc.
SP-9888
Epoxy Novolac (1 or 2 Coats)
Specialty Products, Inc. (SPI)
PTU-UB, POLYSHIELD HT-100F w/AE-4
Polyurea Pure (1, 2, or 3 coats)
Stirling Lloyd Group Plc
Integritank
Methyl Methacrylate/Methyl Methacrylate
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Synavax, Inc.
Heat Shield EPX-H20
Epoxy/Epoxy/Epoxy
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-GARD 256
Epoxy 100% Solids (1 or 2 Coats)
The Thortex Group
3M Scotchkote Epoxy Coating 152LV
Epoxy 100% Solids (1 or 2 Coats)
Tnemec Company, Inc.
Tank Armor
Epoxy 100% Solids (1 or 2 Coats)
U.S. Coatings, LLC
GripLine
Epoxy 100% Solids (1 or 2 Coats)
Valentus Specialty Chemicals
VSC
Organic Zinc/Epoxy/Urethane
Witt Lining Systems
Spectra Blue PVC
Sheet Lining, Thermoplastic
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC Zero-VOC Cold Galvanizing Compound
Zinc-rich, inorganic

CHEMICAL/WATER EXPOSURE - WET FLY ASH

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-20
Epoxy Novolac (1 or 2 Coats)
Arma Coatings
Arma 901 50D
Polyurea Pure (1, 2, or 3 coats)
Atlas Minerals & Chemicals, Inc.
Carbo-Alkor
Brick and Tile, Acid-Resistant
Blome International
Blome
Vinyl Ester/Vinyl Ester/Vinyl Ester
Bowers Industrial
Duromar
Epoxy 100% Solids (1 or 2 Coats)
Burke Industrial Coatings
Burke Liquid Stainless Steel
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Carboline Company
Reactamine
Polyurea Hybrid (1, 2, or 3 coats)
Ceilcote (International Paint LLC)
Ceilcote/Coroline
Epoxy/Epoxy/Epoxy
Cortec Corporation
VpCI 395/2026
Epoxy/Epoxy Novolac/Epoxy Novolac
Creative Polymers LLC
PliaThane 4950
Urethane Elastomeric (1 Coat)
Crossfield Products Corp.
DEX-O-TEX
Epoxy (1-2 coats)/Urethane
Daubert Cromwell
Nox-Rust-3100G
Calcium Sulphonate
Denso North America
Denso
Tape Wraps
Dudick, Inc.
Protecto-Flake
Vinyl Ester/Vinyl Ester/Vinyl Ester
Duromar, Inc.
HPL-4310 / HPL-4310
Epoxy/Epoxy 100% solids
ENECON Corporation
CHEMCLAD
Epoxy/Epoxy 100% solids
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Penetrawel L/F VE Lining
Vinyl Ester/Vinyl Ester/Vinyl Ester
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
Bio-Safe/DeckMaster
Alkyd/Acrylic/Acrylic
Gemite Products Inc.
Corro-Chem 100
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / PC-517 Cyclo-Aliphatic
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Highland International
Spray-Safe 475II/68R
Epoxy (1-2 coats)/Urethane
Induron Coatings, LLC
PermaSafe 100 Ceramic Epoxy
Epoxy 100% Solids (1 or 2 Coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
Ceilcote
Vinyl Ester/Vinyl Ester/Vinyl Ester
IXS Coatings/Ultimate Linings
UL XP 6613
Polyurea Pure (1, 2, or 3 coats)
Jotun Paints Inc.
Chemflake Special
Vinyl Ester/Vinyl Ester/Vinyl Ester
Maxon Technologies
CRS
Other
Milamar Coatings
ICO Rust Guard/Fibercoat CR
Epoxy/Epoxy/Epoxy
National Polymers Inc.
Private Label
Epoxy (1-2 coats)/Urethane
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-80LVHS, NR-95LVHS
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
Ply-Guard UR Polyurea
Polyurea Pure (1, 2, or 3 coats)
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Epoxy 100% Solids (1 or 2 Coats)
REMA Corrosion Control, Inc.
COROFLAKE
Vinyl Ester/Vinyl Ester/Vinyl Ester
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)
Sherwin-Williams
Cor-Cote VEN
Vinyl Ester/Vinyl Ester/Vinyl Ester
Specialty Polymer Coatings, Inc.
SP-9888
Epoxy Novolac (1 or 2 Coats)

POWER PLANTS

Specialty Products, Inc. (SPI)
KS /wAE-4, POLYSHIELD HT-100F w/AE-4, AMP 100 w/AE-4
Polyurea Pure (1, 2, or 3 coats)
Synavax, Inc.
Heat Shield EPX-H20
Epoxy/Epoxy/Epoxy
Termarust Technologies Inc.
Termarust TR2000 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
U.S. Coatings, LLC
GlassGrip
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC Zero-VOC Galvanizing Compound
Zinc-rich, inorganic

CIRCULATING WATER PIPE

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-30
Epoxy 100% Solids (1 or 2 Coats)
Blome International
Blome
Epoxy/Epoxy 100% solids
Bowers Industrial
Duromar
Epoxy 100% Solids (1 or 2 Coats)
Carboline Company
Phenoline/Plasite
Epoxy 100% Solids (1 or 2 Coats)
Ceilcote (International Paint LLC)
Ceilcote/Flakeline
Vinyl Ester/Vinyl Ester/Vinyl Ester
Coatings For Industry, Inc.
U-Series
Epoxy (1-2 coats)/Acrylic (1-2 coats)
Cortec Corporation
VpCI 395/395
Epoxy/Epoxy
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Dampney Co., Inc.
Apexior
Other
Denso North America
Denso
Tape Wraps
Diamond Vogel Inc.
Multi-E-Prime 500/Multi-Thane 330 or 340
Epoxy (1-2 coats)/Urethane
Duromar, Inc.
HPL-2510 / HPL-2510-FR
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Enviroline (International Paint LLC)
Enviroline
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat SP2000 Series
Epoxy/Epoxy 100% solids
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
RUSTOP/MaxLife
Other
Gemite Products Inc.
Fibre-Prime
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Goodwest Linings and Coatings
Blair, Polymeric, Rubber Source
Sheet Lining, Rubber
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic
Epoxy/Epoxy/Epoxy
Hempel (USA), Inc.
Hempaline Series
Epoxy 100% Solids (1 or 2 Coats)
Heresite Protective Coatings, LLC
CSE-6200
Epoxy/Epoxy/Epoxy
Highland International
74-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)
Induron Coatings, LLC
Perma-Clean 100 Ceramic Epoxy
Epoxy 100% Solids (1 or 2 Coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
IXS Coatings/Ultimate Linings
UL XP 6633
Polyurea Pure (1, 2, or 3 coats)
Jotun Paints Inc.
Marathon / Marathon
Epoxy/Epoxy
Lava-Liner
Ultra-Flex ECO5000
Urethane/Urethane
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-80LVHS, NR-95LVHS
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy/Epoxy 100% solids
Plastocor Inc.
Plastocor
Epoxy/Epoxy 100% solids
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyguard Products, Inc.
Polyguard RD-6
Tape Wraps
Polyset
Ply-Guard UR Polyurea
Polyurea Pure (1, 2, or 3 coats)
PPG
Amercoat
Epoxy 100% Solids (1 or 2 Coats)
REMA Corrosion Control, Inc.
CORDFLAKE
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Rhino Linings
Rhino Extreme™ PW
Polyurea Pure (1, 2, or 3 coats)
Sherwin-Williams
Dura-Plate UHS
Epoxy 100% Solids (1 or 2 Coats)
Specialty Polymer Coatings, Inc.
SP-2888 RG
Epoxy 100% Solids (1 or 2 Coats)
Specialty Products, Inc. (SPI)
POLYSHIELD HT-100F UB, POLYSHIELD HT, POLYSHIELD HI-
Polyurea Pure (1, 2, or 3 coats)
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Synavax, Inc.
Heat Shield EPX-H20
Thermal Spray
Termarust Technologies Inc.
Termarust TR2000 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-DUR 560
Epoxy 100% Solids (1 or 2 Coats)
The Thortex Group
3M Scotchkote Epoxy Primer GP 120
Other
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
Tnemec Company, Inc.
Epoxoline
Epoxy 100% Solids (1 or 2 Coats)
U.S. Coatings, LLC
MasticGrip
Epoxy Coal Tar High Build (1 or 2 Coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

FGD STACK INTERIORS

3L&T Inc.
StackGard-255SOW
Other
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-20
Epoxy Novolac (1 or 2 Coats)
Atlas Minerals & Chemicals, Inc.
Chemgruf
Vinyl Ester/Vinyl Ester/Vinyl Ester
Bowers Industrial
Duromar
Epoxy 100% Solids (1 or 2 Coats)
Burke Industrial Coatings
Burke Liquid Stainless Steel
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled

Carboline Company
Plasite
Vinyl Ester/Vinyl Ester/Vinyl Ester
Ceilcote (International Paint LLC)
Ceilcote/Flakeline
Vinyl Ester/Vinyl Ester/Vinyl Ester
Crossfield Products Corp.
DEX-O-TEX
Epoxy Novolac (1 or 2 Coats)
Dudick, Inc.
Protecto-Coat
Epoxy/Vinyl Ester/Vinyl Ester
Duromar, Inc.
HPL-4330 / HPL-4330
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD XC
Epoxy/Epoxy Novolac/Epoxy Novolac
ErgonArmor Novocoat
PennGuard Block
Borosilicate Glass Block
Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)
Hempel (USA), Inc.
Hempaline Series
Epoxy/Epoxy 100% solids
Heresite Protective Coatings, LLC
Heresite P-403L
Other
Highland International
74-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
Ceilcote
Vinyl Ester/Vinyl Ester/Vinyl Ester
IXS Coatings/Ultimate Linings
UL XP 6613
Polyurea Pure (1, 2, or 3 coats)
Jotun Paints Inc.
Chemflake Special
Vinyl Ester/Vinyl Ester/Vinyl Ester
Key Resin Company/Flowcrete
Key Vinyl Ester
Vinyl Ester/Vinyl Ester/Vinyl Ester
Milamar Coatings
2900 LS
Epoxy/Epoxy Novolac/Epoxy Novolac
New Guard Coatings Inc.
Jotun/PPG
Other
Nukote Coating Systems International
Nukote Chemshield FC
Other
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
PPG
Amercoat
Epoxy/Epoxy Phenolic/Epoxy Phenolic
REMA Corrosion Control, Inc.
COROFLAKE
Vinyl Ester/Vinyl Ester/Vinyl Ester
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)
Sherwin-Williams
Cor-Cote VEN TF
Vinyl Ester/Vinyl Ester/Vinyl Ester
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
The Thortex Group
3M Scotchkote Epoxy Coating 175UC
Epoxy 100% Solids (1 or 2 Coats)
U.S. Coatings, LLC
GripLine
Vinyl Ester/Vinyl Ester/Vinyl Ester
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

FGD INTERIORS

3L&T Inc.
FlueGard-225SQC
Other
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-20
Epoxy Novolac (1 or 2 Coats)
Atlas Minerals & Chemicals, Inc.
Chemprof
Vinyl Ester/Vinyl Ester/Vinyl Ester
Blome International
Blome
Vinyl Ester/Vinyl Ester/Vinyl Ester
Bowers Industrial
Duromar
Epoxy 100% Solids (1 or 2 Coats)
Burke Industrial Coatings
Burke Liquid Stainless Steel
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Carboline Company
Plasite
Vinyl Ester/Vinyl Ester/Vinyl Ester
Ceilcote (International Paint LLC)
Ceilcote/Ceilcrete
Vinyl Ester/Vinyl Ester/Vinyl Ester
Crossfield Products Corp.
DEX-O-TEX
Epoxy/Epoxy/Epoxy
Dudick, Inc.
Protecto-Coat
Epoxy/Vinyl Ester/Vinyl Ester
Duromar, Inc.
HPL-2131
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD XC
Epoxy/Epoxy Novolac/Epoxy Novolac
ErgonArmor Novocoat
PennTrowel L/F VE Linings
Vinyl Ester/Vinyl Ester/Vinyl Ester
Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)
Hempel (USA), Inc.
Hempaline Series
Epoxy/Epoxy 100% solids
Heresite Protective Coatings, LLC
Heresite P-403L
Other
Highland International
74-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
Ceilcote
Vinyl Ester/Vinyl Ester/Vinyl Ester
IXS Coatings/Ultimate Linings
UL XP 6613
Polyurea Pure (1, 2, or 3 coats)
Jotun Paints Inc.
Chemflake Special
Vinyl Ester/Vinyl Ester/Vinyl Ester
Key Resin Company/Flowcrete
Key Vinyl Ester
Vinyl Ester/Vinyl Ester/Vinyl Ester
Milamar Coatings
1550 HT
Epoxy/Epoxy Novolac/Epoxy Novolac
New Guard Coatings Inc.
Jotun/PPG
Other
Nukote Coating Systems International
Nukote Chemshield FC
Other
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge Brand
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
PPG
Amercoat
Epoxy Zinc-rich/MCU/MCU
REMA Corrosion Control, Inc.
COROFLAKE, TOPLINE AR
Vinyl Ester/Vinyl Ester/Vinyl Ester
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)

Sherwin-Williams
Cor-Cote VEN TF
Vinyl Ester/Vinyl Ester/Vinyl Ester
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
U.S. Coatings, LLC
GripLine
Vinyl Ester/Vinyl Ester/Vinyl Ester
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

RAILCAR INDUSTRY

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EXTERIOR WEATHERING, UV, GENERAL INDUSTRIAL

Locomotive

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane

Arma Coatings
Arma Polyaspartic spray Polyurea
Polyurea Pure (1, 2, or 3 coats)

Bowers Industrial
Gulf Coast Paint
Epoxy (1-2 coats)/Urethane

Carboline Company
Carboguard/Carbothane
Epoxy (1-2 coats)/Urethane

Coatings For Industry, Inc.
U-Series
Urethane/Urethane

Cortec Corporation
VpCI-396/384
Urethane/Urethane

Cote-L Industries Inc.
durabak18/durabak18 smooth
Urethane/Urethane

Creative Material Technologies, Ltd.
Dyna-PUR (TM)
Zinc-rich, organic

Creative Polymers LLC
Thermecoat 2600
Urethane/Urethane

Davis Paint Company
Tuff Thane
Epoxy (1-2 coats)/Urethane

Eoncoat LLC
EonCoat
Other

FSC Coatings Inc.
RUSTOP/SP-X Silicone Poly Plus
Epoxy (1-2 coats)/Urethane

G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic

Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)

Gulf Coast Paint Mfg., Inc.
PC-2.8 Quick Dry Epoxy / CT-370 Acrylic Aliphatic
Epoxy (1-2 coats)/Urethane

Highland International
74-NS Anti-Graffiti Non-Stick Coating
Epoxy Novolac (1 or 2 Coats)

Hy-Tech Thermal Solutions
METAL SHIELD
Calcium Sulphonate

Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)

Insulating Coatings Corporation
Astec 2000 System
Alkyd/Acrylic/Acrylic

International Metalizing Corporation
Reddevil 888
Thermal Spray

International Paint LLC
International
Epoxy (1-2 coats)/Urethane

IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)

Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps

Jotun Paints Inc.
Barrier / Jotamastic 90 / Hardtop AX
Organic Zinc/Epoxy/Urethane

Mascoat
MI-DTI
Alkyd/Acrylic/Acrylic

Maxon Technologies
CRS
Other

New Guard Coatings Inc.
Jotun/PPG
Other

Nukote Coating Systems International
Nukote PA II
Polyurea Pure (1, 2, or 3 coats)

Oak Ridge Foam & Coating Systems, Inc
Oak Ridge
Polyurea Pure (1, 2, or 3 coats)

Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)

Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)

Premier Coating Systems Inc
PCS-#1111/PCS-#4300
Epoxy (1-2 coats)/Fluoroorethane

Quantum Chemical
Illustrium
Urethane Elastomeric (1 Coat)

Randolph Products
Randolph Products Urachem Ultra
Other

Rhino Linings
Rhino SolarMax®
Polyurea Hybrid (1, 2, or 3 coats)

Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)

Sherwin-Williams
Macropoxy 646-100 /Acrolon Ultra/ Diamond Clad
Epoxy (1-2 coats)/Urethane

Specialty Polymer Coatings, Inc.
SP-5885 SF SP-1088
Epoxy (1-2 coats)/Urethane

Specialty Products, Inc. (SPI)
POLYSHIELD HT-100F w/AE-4, AMP 100, HARD CAP-100
Polyurea Pure (1, 2, or 3 coats)

Synavax, Inc.
Heat Shield EPX-H20
Thermal Spray

Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane

ThermaCote, Inc.
ThermaCote®
Other (less than 100 g/L)

Thermion
Thermion
Thermal Spray

TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray

U.S. Coatings, LLC
RailGard/UreGrip
Epoxy (1-2 coats)/Urethane

Valentus Specialty Chemicals
RailShield VSC
Urethane/Urethane

ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

EXTERIOR WEATHERING, UV, GENERAL INDUSTRIAL

Railcars

3M Corrosion Protection Products
Scotchkote
Epoxy (1-2 coats)/Urethane
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
Arma Coatings
Arma 952 Polyurea Hybrid
Polyurea Hybrid (1, 2, or 3 coats)
Axalta
Ganicin EE 198
Epoxy Zinc-rich/MCLU/MCLU
Bowers Industrial
Gulf Coast Paint
Epoxy (1-2 coats)/Urethane
Carboline Company
Carboguard/Phenoline/Plasite
Epoxy 100% Solids (1 or 2 Coats)
Coatings For Industry, Inc.
U-Series
Urethane/Urethane
Cortec Corporation
VpCI-386
Alkyd/Acrylic/Acrylic
Cote-L Industries Inc.
durabak18/durabak18 smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Creative Polymers LLC
Themecoat 2600
Urethane/Urethane
Davis Paint Company
Tuff Thane
Epoxy (1-2 coats)/Urethane
ENECON Corporation
ENESEAL CR
Other
FSC Coatings Inc.
RUSTOP Metallic Urethane/Super Urethane
Urethane/Urethane
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
PC-2.8 Quick Dry Epoxy / CT-370 Acrylic Aliphatic Po
Epoxy (1-2 coats)/Urethane
Hempel (USA), Inc.
Hempadur Mastic 45883
Epoxy 100% Solids (1 or 2 Coats)
Heresite Protective Coatings, LLC
Heresite UC5500
Urethane/Urethane
Highland International
74-NS Anti-Graffiti Non-Stick Coating
Epoxy Novolac (1 or 2 Coats)
Hy-Tech Thermal Solutions
METAL SHIELD
Calcium Sulphonate
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
Insulating Coatings Corporation
Astec 2000 System
Alkyd/Acrylic/Acrylic
International Metalizing Corporation
Reddevil 8811
Thermal Spray
International Paint LLC
International
Epoxy 100% Solids (1 or 2 Coats)
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps
Jotun Paints Inc.
Jotacote Universal N10 / Hardtop AX
Epoxy (1-2 coats)/Urethane
Mascoat
MI-DTI
Alkyd/Acrylic/Acrylic
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Jotun/PPG
Other
Nukote Coating Systems International
Nukote PA II
Polyurea Pure (1, 2, or 3 coats)
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
PPG
AT399/AT450H
Epoxy (1-2 coats)/Urethane
Premier Coating Systems Inc
PCS-#1111/PCS-#4300
Epoxy (1-2 coats)/Fluorourethane
Protek Paint Ltd.
blue steel
Other
Quantum Chemical
Illustrium
Urethane Elastomeric (1 Coat)
Randolph Products
Randolph Products Urachem Ultra
Other
Rhino Linings
Rhino SolarMax®
Polyurea Hybrid (1, 2, or 3 coats)
Royal Chemical Corp.
AQ056
Alkyd/Acrylic/Acrylic
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)
Sherwin-Williams
SherCryl 1300
Other
Specialty Polymer Coatings, Inc.
SP-1864
Urethane Elastomeric (1 Coat)
Specialty Products, Inc. (SPI)
POLYSHIELD HT-100F w/AE-4, AMP 100, HARD CAP-100
Polyurea Pure (1, 2, or 3 coats)
Synavax, Inc.
Heat Shield PT
Thermal Spray
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane
ThermaCote, Inc.
ThermaCote®: Other (less than 100 g/L)
Thermion
Thermion
Thermal Spray
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
RailGard
Epoxy/Epoxy/Epoxy
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

LININGS FOR STEEL RAILCAR INTERIORS

Acids

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR EE-121
Epoxy Novolac (1 or 2 Coats)
Bowers Industrial
Duromar
Epoxy Novolac (1 or 2 Coats)
Carboline Company
Plasite/Phenoline
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
Ceilcote (International Paint LLC)
Ceilcote/ Flakeline MR
Vinyl Ester/Vinyl Ester/Vinyl Ester
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
CORCHEM Corporation of Texas
CORCHEM® 243
Vinyl Ester/Vinyl Ester/Vinyl Ester
Cortec Corporation
VpCI 395/2026
Epoxy/Epoxy Novolac/Epoxy Novolac
Cote-L Industries Inc.
durabak/durabak smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Duromar, Inc.
HPL-4310 / HPL-4310
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy Novolac (1 or 2 Coats)
Enviroline (International Paint LLC)
Ceilcote
Epoxy/Vinyl Ester/Vinyl Ester
Eoncoat LLC
EonCoat
Other

ErgonArmor Novocoat
Novocoat SC3300
Epoxy/Epoxy Novolac/Epoxy Novolac
Goodwest Linings and Coatings
Blair, Polymeric, Rubber Source
Sheet Lining, Rubber
Hempel (USA), Inc.
Hempadur Series
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
Heresite Protective Coatings, LLC
Heresite P-403L
Other
Highland International
34-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
Enviroline
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
New Guard Coatings Inc.
Jotun/PPG
Other
Nukote Coating Systems International
Nukote Chemshield FC
Other
Peerless Industrial Systems
epigen chemproof
Epoxy/Epoxy Novolac/Epoxy Novolac
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Randolph Products
Randolph Products Randogrip Navy G
Other
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Wax
Sherwin-Williams
Corobond VE Primer/Magnalux 304 FF
Vinyl Ester/Vinyl Ester/Vinyl Ester
Specialty Polymer Coatings, Inc.
SP-9888
Epoxy Novolac (1 or 2 Coats)
Specialty Products, Inc. (SPI)
PTU-LIB
Polyurea Pure (1, 2, or 3 coats)
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
U.S. Coatings, LLC
GripLine
Phenolic/Fusion-Bonded Epoxy
Valentus Specialty Chemicals
GripLine
Phenolic/Fusion-Bonded Epoxy
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

LININGS FOR STEEL RAILCAR INTERIORS

Alkalis

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-20
Epoxy Novolac (1 or 2 Coats)
Axalta
Tufcote EG 189
Epoxy/Epoxy/Epoxy
Bowers Industrial
Duromar
Epoxy/Epoxy 100% solids
Carboline Company
Carboguard/Phenoline/Plasite
Epoxy/Epoxy/Epoxy
Ceilcote (International Paint LLC)
Ceilcote/ Flakeline MR
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
CORCHEM Corporation of Texas
CORCHEM® 243
Vinyl Ester/Vinyl Ester/Vinyl Ester
Cortec Corporation
VpCI 395/2026
Epoxy/Epoxy Novolac/Epoxy Novolac
Cote-L Industries Inc.
durabak/durabak smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Duromar, Inc.
HPL-4310 / HPL-4310
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy Novolac (1 or 2 Coats)
Enviroline (International Paint LLC)
Enviroline
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
PeneCoat 401 Silicon nanoparticle lining
Other
Goodwest Linings and Coatings
Blair, Polymeric, Rubber Source
Sheet Lining, Rubber
Hempel (USA), Inc.
Hempadur Series
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
Highland International
34-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
Enviroline
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Jotun/PPG
Other
Nukote Coating Systems International
Nukote Chemshield
Other
Peerless Industrial Systems
epigen chemproof
Epoxy/Epoxy Novolac/Epoxy Novolac
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
PPG
AT253
Epoxy Novolac (1 or 2 Coats)
Randolph Products
Randolph Products Randogrip Navy G
Other
Rhino Linings
HiChem™
Urethane/Urethane
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
Nova-Plate UHS
Epoxy Novolac (1 or 2 Coats)
Specialty Polymer Coatings, Inc.
SP-9888
Epoxy Novolac (1 or 2 Coats)
Specialty Products, Inc. (SPI)
PTU w/AE-4 POLYSHIELD HT-100F w/AE-4
Polyurea Pure (1, 2, or 3 coats)
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
U.S. Coatings, LLC
GripLine
Epoxy Novolac (1 or 2 Coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

LININGS FOR STEEL RAILCAR INTERIORS

Bulk Solids

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-20
Epoxy Novolac (1 or 2 Coats)
Arma Coatings
Arma 901 Polyurea
Polyurea Pure (1, 2, or 3 coats)
Bowers Industrial
Duromar
Epoxy/Epoxy 100% solids
Carboline Company
Phenoline/Plasite
Epoxy 100% Solids (1 or 2 Coats)
CORCHEM Corporation of Texas
CORCHEM® 261
Organic Zinc/Epoxy Flake Filled/Epoxy Flake Filled
Cortec Corporation
VpCI 395/2026
Epoxy/Epoxy Novolac/Epoxy Novolac

Cote-L Industries Inc.
durabak/durabak smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
STEEL-COTE(TM)
Polyurea Pure (1, 2, or 3 coats)
Duromar, Inc.
HPL-2221 / HPL-2221
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy/Epoxy 100% solids
Enviroline (International Paint LLC)
Enviroline
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat SC3310 Ceramic Liquid Epoxy
Epoxy 100% Solids (1 or 2 Coats)
Fabick, Inc. – Coatings and Sealants
Fabick
Polyurea Pure (1, 2, or 3 coats)
FSC Coatings Inc.
RUSTOP Aluminum Urethane
Urethane/Urethane
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Hempel (USA), Inc.
Hempadur Series
Epoxy 100% Solids (1 or 2 Coats)
Heresite Protective Coatings, LLC
Heresite CSE-6200
Epoxy/Epoxy/Epoxy
Hy-Tech Thermal Solutions
BARRIER COAT
Other
Industrial Solutions USA, LLC.
Polycoat
Urethane Elastomeric (1 Coat)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
Enviroline
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jotun Paints Inc.
Marathon 1000 GF / Marathon 1000 GF
Epoxy Flake Filled/Epoxy Flake Filled
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-80LVHS, NR-95LVHS
Urethane/Urethane
Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigem
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
PPG
AT428PCLO
Epoxy 100% Solids (1 or 2 Coats)
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Urethane/Urethane

Sherwin-Williams
CarFlex HS
Epoxy 100% Solids (1 or 2 Coats)
Specialty Products, Inc. (SPI)
ULTRA BOND-100, AMP 100 w/AE-4, POLYSHIELD HT-100F W
Polyurea Pure (1, 2, or 3 coats)
Synavax, Inc.
Nansulate PT
Thermal Spray
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
U.S. Coatings, LLC
GripLine
Epoxy Novolac (1 or 2 Coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

LININGS FOR STEEL RAILCAR INTERIORS

Dairy

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
Arma Coatings
Arma 901 Polyurea
Polyurea Hybrid (1, 2, or 3 coats)
Bowers Industrial
Duromar
Epoxy/Epoxy 100% solids
Carboline Company
Carboguard/Phenoline/Plasite
Epoxy 100% Solids (1 or 2 Coats)
Cortec Corporation
VpCI 395/2026
Epoxy/Epoxy Novolac/Epoxy Novolac
Cote-L Industries Inc.
durabak/durabak smooth
Urethane/Urethane
ENECON Corporation
CHEMCLAD
Epoxy Novolac (1 or 2 Coats)
Eoncoat LLC
EonCoat
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Hempel (USA), Inc.
Hempadur Series
Epoxy 100% Solids (1 or 2 Coats)
Heresite Protective Coatings, LLC
CSE-6200
Epoxy/Epoxy/Epoxy
International Metalizing Corporation
Reddevil 888
Thermal Spray
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jotun Paints Inc.
Tankguard SF 1 / Tankguard SF 1
Epoxy Novolac (1 or 2 Coats)
New Guard Coatings Inc.
Jotun/PPG
Other
Nukote Coating Systems International
Nukote ST pw
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigem
Epoxy/Epoxy 100% solids
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Randolph Products
Randolph Products RP 2500 Zero VOC
Other
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
Corobond VE Primer/Magnalux 304/Magnalux 304
Vinyl Ester/Vinyl Ester/Vinyl Ester
Specialty Products, Inc. (SPI)
POLYSHIELD HT w/AE-4, AMP 100, UltraBond HT FC
Polyurea Pure (1, 2, or 3 coats)
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
U.S. Coatings, LLC
GripLine
Epoxy 100% Solids (1 or 2 Coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

LININGS FOR STEEL RAILCAR INTERIORS

Hydrocarbons

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-20
Epoxy Novolac (1 or 2 Coats)
Axalta
Tufcote EG 198
Epoxy/Epoxy

Bowers Industrial
Duromar
Epoxy Novolac (1 or 2 Coats)
Carboline Company
Carbozinc
Zinc-rich, inorganic
Ceilcote (International Paint LLC)
Ceilcote/ Flakeline MR
Vinyl Ester/Vinyl Ester/Vinyl Ester
CORCHEM Corporation of Texas
CORCHEM® 207
Epoxy/Epoxy
Cortec Corporation
VpCI 395/2026
Epoxy/Epoxy Novolac/Epoxy Novolac
Cote-L Industries Inc.
durabak/durabak smooth
Urethane/Urethane
Duromar, Inc.
HPL-2310 / HPL-2310
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy Novolac (1 or 2 Coats)
Enviroline (International Paint LLC)
Enviroline
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat SC3300 Series Lining
Epoxy Novolac (1 or 2 Coats)
Goodwest Linings and Coatings
Enviroline 405HT
Epoxy Novolac (1 or 2 Coats)
Hempel (USA), Inc.
Hempaline
Epoxy 100% Solids (1 or 2 Coats)
Heresite Protective Coatings, LLC
Heresite P-403L
Other
Highland International
14-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
International
Epoxy Novolac (1 or 2 Coats)
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jotun Paints Inc.
Tankguard Plus / Tankguard Plus
Epoxy Novolac (1 or 2 Coats)
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Jotun/PPG
Other
Nukote Coating Systems International
Nukote HCR
Polyurea Hybrid (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
PPG
AT253
Epoxy Novolac (1 or 2 Coats)
Rhino Linings
Rhino Extreme™
Epoxy/Epoxy/Epoxy
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
Nova-Plate UHS
Epoxy Novolac (1 or 2 Coats)
Specialty Polymer Coatings, Inc.
SP-9888
Epoxy Novolac (1 or 2 Coats)
Specialty Products, Inc. (SPI)
PTU w/AE-4, POLYSHIELD HT-100F w/AE-4
Polyurea Pure (1, 2, or 3 coats)
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
U.S. Coatings, LLC
ZincGard
Zinc-rich, inorganic
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

LININGS FOR STEEL RAILCAR INTERIORS

Livestock Carriers

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
Arma Coatings
Arma 901 Polyurea
Polyurea Pure (1, 2, or 3 coats)
Bowers Industrial
Quest
Polyurea Hybrid (1, 2, or 3 coats)
Carboline Company
Carboguard/Phenoline/Plasite
Epoxy 100% Solids (1 or 2 Coats)
CORCHEM Corporation of Texas
McTHANE™ 5150
Zinc-rich, inorganic
Cortec Corporation
VpCI 395/2026
Epoxy/Epoxy Novolac/Epoxy Novolac
Cote-L Industries Inc.
durabak/durabak smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Hybrid (1, 2, or 3 coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat 80-80 Alloy Metal Flake Coating
Epoxy Flake Filled/Epoxy Flake Filled
FSC Coatings Inc.
RUSTOP Aluminum Urethane
Urethane/Urethane
Global EcoTechnologies
ENDURA-TUF
Urethane Elastomeric (1 Coat)
Hempel (USA), Inc.
Hempadur Series
Epoxy Novolac (1 or 2 Coats)
Industrial Solutions USA, LLC
Polycoat
Urethane Elastomeric (1 Coat)
International Metalizing Corporation
Reddevil 888
Thermal Spray
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jotun Paints Inc.
Marathon 1000 GF / Marathon 1000 GF
Epoxy Flake Filled/Epoxy Flake Filled
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Jotun/PPG
Other
Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
PPG
AT248PLCO
Epoxy 100% Solids (1 or 2 Coats)
Randolph Products
Randolph Products RP 2500 Zero VOC
Other
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)
Sherwin-Williams
Sher-Glass Low VOC FF
Epoxy Flake Filled/Epoxy Flake Filled
Specialty Polymer Coatings, Inc.
SP-1386
Urethane Elastomeric (1 Coat)
Specialty Products, Inc. (SPI)
ULTRA BOND-100, POLYSHIELD HT-100F w/AE-4,
KS W/AE-4
Polyurea Pure (1, 2, or 3 coats)
Synavax, Inc.
Heat Shield PT
Thermal Spray
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
U.S. Coatings, LLC
EpoxyGalp
Epoxy/Epoxy/Epoxy
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

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EXTERNAL OF BURIED PIPE

3M Corrosion Protection Products
Scotchkote
Fusion-Bonded Epoxy (1-2 coats)
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
Aegion Coating Services
Aegion Coating Services
Fusion-Bonded Epoxy (1-2 coats)
Arma Coatings
Arma 901 series
Polyurea Pure (1, 2, or 3 coats)
Axalta
NAP-GARD
Fusion-Bonded Epoxy (1-2 coats)
Bowers Industrial
Dampney
Coal Tar/Asphalt
Carboline Company
Polyclad
Urethane/Urethane
CCI Con-Tech of California, Inc.
HYDRO-POX
Epoxy/Epoxy 100% solids
Ceilcote (International Paint LLC)
Ceilcote/ Flakeline
Polyester/Polyester/Polyester
Chemline Inc
Chemline 2265
Urethane/Urethane
Cloverdale Paint Inc.
Clovamastic
Epoxy/Epoxy
CORCHEM Corporation of Texas
CORCHEM® 247
Epoxy Coal Tar High Build (1 or 2 Coats)
Cortec Corporation
VpCI-395/395
Epoxy/Epoxy
Cote-L Industries Inc.
Durabak/durabak smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Daubert Cromwell
Nox-Rust-5100
Coal Tar/Asphalt
Denso North America
Protal
Other
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy/Epoxy/Epoxy
Diamond Vogel Inc.
Cerami-Tar
Epoxy Coal Tar High Build (1 or 2 Coats)
Duromar, Inc.
HPL-2510 / HPL-2510
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Enviroline (International Paint LLC)
Enviroline
Epoxy Novolac (1 or 2 Coats)
ErgonArmor Novocoat
Novocoat SC2200
Epoxy Novolac (1 or 2 Coats)
Farwest Corrosion Control Company
Polyken
Tape Wraps
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
Gemite Products Inc.
Fibre-Prime
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Goodwest Linings and Coatings
Carboline 300M
Epoxy Coal Tar High Build (1 or 2 Coats)
Hempel (USA), Inc.
Hempaline Series
Epoxy Novolac (1 or 2 Coats)
Heresite Protective Coatings, LLC
Heresite CSE-6200
Epoxy Flake Filled/Epoxy Flake Filled
Highland International
74 Chem-Temp Hybrid Epoxy Lining
Epoxy Novolac (1 or 2 Coats)
Induron Coatings, LLC
Warrior 100
Epoxy/Epoxy 100% solids
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
International
Epoxy 100% Solids (1 or 2 Coats)
IXS Coatings/Ultimate Linings
Spray Foam
Polyurea Pure (1, 2, or 3 coats)
Jotun Paints Inc.
Marathon 1000 GF / Marathon 1000 GF
Epoxy Flake Filled/Epoxy Flake Filled
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
LVHS Series
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote HTD
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyguard Products, Inc.
Polyguard RD-6
Tape Wraps
PPG
Amercoat
Epoxy 100% Solids (1 or 2 Coats)
Rhino Linings
Rhino Linings TuffGrip®
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)
Sherwin-Williams
Dura-Plate UHS / Fast Clad ER
Epoxy/Epoxy 100% solids

Specialty Polymer Coatings, Inc.
SP-2888 RG
Epoxy 100% Solids (1 or 2 Coats)
Specialty Products, Inc. (SPI)
KS w/AE-4, POLYSHIELD HT-100F w/AE-4
Polyurea Pure (1, 2, or 3 coats)
Sprayroq
SprayShield Green 2
Urethane Elastomeric (1 Coat)
Synavax, Inc.
Heat Shield EPX-H20
Epoxy/Epoxy/Epoxy
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
ThermaCote, Inc.
ThermaCote®. Other (less than 100 g/L)
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-DUR 561
Epoxy 100% Solids (1 or 2 Coats)
The Thortex Group
3M Scotchkote 323
Epoxy/Epoxy 100% solids
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
GripLine
Epoxy/Epoxy Phenolic/Epoxy Phenolic
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

INTERNAL OF BURIED PIPE

3M Corrosion Protection Products
Scotchkote
Fusion-Bonded Epoxy (1-2 coats)
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
Axalta
NAP-GARD
Fusion-Bonded Epoxy (1-2 coats)
Bowers Industrial
Duromar
Epoxy 100% Solids (1 or 2 Coats)
Carboline Company
Phenoline/Plasite/SPC
Epoxy 100% Solids (1 or 2 Coats)
CCI Con-Tech of California, Inc.
HYDRO-POX
Epoxy/Epoxy 100% solids
Ceilcote (International Paint LLC)
Ceilcote/ Flakeline
Vinyl Ester/Vinyl Ester/Vinyl Ester
Chemline Inc
Chemline 2265
Urethane/Urethane
Cloverdale Paint Inc.
LifeLast
Urethane Elastomeric (1 Coat)
CORCHEM Corporation of Texas
CORCHEM® 207
Epoxy 100% Solids (1 or 2 Coats)
Cortec Corporation
VpCI-395/395
Epoxy/Epoxy
Cote-L Industries Inc.
Durabak/durabak smooth
Urethane/Urethane
Denso North America
Protal
Other
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy/Epoxy Novolac/Epoxy Novolac
Duromar, Inc.
HPL-2510 / HPL-2510
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Enviroline (International Paint LLC)
Enviroline
Epoxy Novolac (1 or 2 Coats)
ErgonArmor Novocoat
Novocoat SC3300 Series
Epoxy Novolac (1 or 2 Coats)
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
Gemite Products Inc.
Fibre-Prime
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Goodwest Linings and Coatings
3M Scotchkote 134
Fusion-Bonded Epoxy (1-2 coats)
Hempel (USA), Inc.
Hempadur Series
Other
Heresite Protective Coatings, LLC
Heresite P-403L
Other
Highland International
74 Chem-Temp Hybrid Epoxy Lining
Epoxy Novolac (1 or 2 Coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
International
Epoxy/Epoxy Novolac/Epoxy Novolac
IXS Coatings/Ultimate Linings
Spray Foam
Polyurea Hybrid (1, 2, or 3 coats)
Jotun Paints Inc.
Tankguard 412
Epoxy Novolac (1 or 2 Coats)
New Guard Coatings Inc.
Jotun/PPG
Other
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)

PPG
Amercoat
Epoxy/Epoxy/Epoxy
Rhino Linings
Pipeliner™
Polyurea Hybrid (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)

Sherwin-Williams
Dura-Plate UHS
Epoxy 100% Solids (1 or 2 Coats)
Specialty Polymer Coatings, Inc.
SP-9888
Epoxy 100% Solids (1 or 2 Coats)
Specialty Products, Inc. (SPI)
WATERSAFE-UBL WATERSAFE II, POLYSHIELD HT-100F w/AE-
Polyurea Pure (1, 2, or 3 coats)
Sprayroq
SprayWall
Urethane/Urethane
Stirling Lloyd Group Plc.
Permare
Other
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
The Thortex Group
Thortex Lining System
Other
Tnemec Company, Inc.
Tank Armor
Epoxy 100% Solids (1 or 2 Coats)
U.S. Coatings, LLC
EpoxyGrip
Epoxy 100% Solids (1 or 2 Coats)
VersaFlex Incorporated
AmStruct
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

FIELD JOINT COATING OF BURIED PIPE

3M Corrosion Protection Products
Scotchkote
Epoxy 100% Solids (1 or 2 Coats)
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane

TRANSMISSION PIPELINE

Aegion Coating Services
Aegion Coating Services
Fusion-Bonded Epoxy (1-2 coats)

Arma Coatings
Arma Polyurea 90AS
Polyurea Pure (1, 2, or 3 coats)

Axalta
NAP-GARD
Fusion-Bonded Epoxy (1-2 coats)

Bowers Industrial
Dampney
Epoxy Coal Tar High Build (1 or 2 Coats)

Carboline Company
Polyclad/SPC
Epoxy 100% Solids (1 or 2 Coats)

CCI Con-Tech of California, Inc.
HYDRO-POX
Epoxy/Epoxy 100% solids

Ceilcote (International Paint LLC)
Ceilcote/ Flakeline
Vinyl Ester/Vinyl Ester/Vinyl Ester

Cloverdale Paint Inc.
Clovaline girth weld
Epoxy/Epoxy 100% solids

CORCHEM Corporation of Texas
CORCHEM® 247
Epoxy Coal Tar High Build (1 or 2 Coats)

Cortec Corporation
VpCI-395/395
Epoxy/Epoxy

Cote-L Industries Inc.
Durabak/durabak smooth
Urethane/Urethane

CRC-Evans
F.A.S.T (Fully Automated Spray Technology)
Epoxy 100% Solids (1 or 2 Coats)

Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)

Daubert Cromwell
Versil-Pak
Wax

Denso North America
Protal
Other

Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy/Epoxy/Epoxy

Diamond Vogel Inc.
Ceram-Tar
Epoxy Coal Tar High Build (1 or 2 Coats)

Duromar, Inc.
SAR
Epoxy 100% Solids (1 or 2 Coats)

Enviroline (International Paint LLC)
Enviroline
Epoxy Novolac (1 or 2 Coats)

ErgonArmor Novocoat
Novocoat SC2200
Epoxy 100% Solids (1 or 2 Coats)

Farwest Corrosion Control Company
3M and Denso
Epoxy/Epoxy 100% solids

Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)

Gemite Products Inc.
Fibre-Prime
Other

Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)

Hempel (USA), Inc.
Hempaline Series
Epoxy 100% Solids (1 or 2 Coats)

Highland International
74 Chem-Temp Hybrid Epoxy Lining
Epoxy Novolac (1 or 2 Coats)

International Metalizing Corporation
Reddevil 888
Thermal Spray

International Paint LLC
International
Epoxy/Epoxy/Epoxy

IXS Coatings/Ultimate Linings
Spray Foam
Polyurea Hybrid (1, 2, or 3 coats)

Maxon Technologies
CRS
Other

New Guard Coatings Inc.
Jotun/PPG
Other

Normac Adhesive Products Inc.
LVHS Series
Urethane/Urethane

NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)

Nukote Coating Systems International
Nukote LP
Polyurea Pure (1, 2, or 3 coats)

Peerless Industrial Systems
epigen kis
Other

Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)

Polyguard Products, Inc.
Polyguard RD-6
Tape Wraps

PPG
Amercoat
Epoxy 100% Solids (1 or 2 Coats)

Rhino Linings
Rhino Linings™ Epoxy
Epoxy 100% Solids (1 or 2 Coats)

Sauereisen, Inc.
Sauereisen
Urethane/Urethane

Sherwin-Williams
Fast Clad ER
Epoxy 100% Solids (1 or 2 Coats)

Specialty Polymer Coatings, Inc.
SP-2888 RG
Epoxy 100% Solids (1 or 2 Coats)

Specialty Products, Inc. (SPI)
POLYSHIELD HT w/AE-4, ElastaFLEX III w/AE-4, EPL-9
Polyurea Pure (1, 2, or 3 coats)

Sprayroq
SprayShield Green 2
Urethane/Urethane

Synavax, Inc.
Heat Shield EPX-H20
Epoxy/Epoxy/Epoxy

Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy

Thermion
Thermion
Thermal Spray

Thin Film Technology, Inc.
BIO-DUR 561
Epoxy 100% Solids (1 or 2 Coats)

The Thortex Group
3M Scotchkote 323
Epoxy/Epoxy 100% solids

TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray

U.S. Coatings, LLC
EpoxyGrip
Epoxy 100% Solids (1 or 2 Coats)

Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

ABOVE GROUND PIPE EXTERIORS

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane

Arma Coatings
Arma 901 & Spray Aspartic
Polyurea Pure (1, 2, or 3 coats)

Bowers Industrial
Gulf Coast Paint
Epoxy (1-2 coats)/Urethane

Carboline Company
Carbozinc/Carboguard/Carbothane
Organic Zinc/Epoxy/Urethane

Ceilcote (International Paint LLC)
Ceilcote/ Flakeline
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled

Chemline Inc
Chemline 2265
Urethane/Urethane

Cloverdale Paint Inc.
Armourshield
Epoxy (1-2 coats)/Urethane
Coatings For Industry, Inc.
U-Series
Urethane/Urethane
Cortec Corporation
VpCI-395/386
Epoxy (1-2 coats)/Acrylic (1-2 coats)
Cote-L Industries Inc.
Durabak18/durabak18 smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Denso North America
Protal
Other
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Organic Zinc/Epoxy/Urethane
Diamond Vogel Inc.
Endura-Zinc 768/Multi-E-Prime 500/Multi-Thane 330 or
Organic Zinc/Epoxy/Urethane
Duromar, Inc.
HPL-1110 / HPL-1110
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Enviroline (International Paint LLC)
Enviroline
Epoxy Novolac (1 or 2 Coats)
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat R180, Alloy Flake Coating
Epoxy Flake Filled/Epoxy Flake Filled
Farwest Corrosion Control Company
Trenton
Tape Wraps
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
RUSTOP/Silicone Poly Plus
Epoxy (1-2 coats)/Urethane
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Fibre-Prime
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Goodwest Linings and Coatings
Carboline, Sherwin-Williams, Devoe
Organic Zinc/Epoxy/Urethane
Hempel (USA), Inc.
Quattro Series/Hempathane
Epoxy (1-2 coats)/Urethane
Heresite Protective Coatings, LLC
CSE-6200/UC-5500
Epoxy (1-2 coats)/Urethane
Highland International
Spray-Safe 475R/68R
Epoxy (1-2 coats)/Urethane
H-I-S Coatings
H-I-S Coatings
Epoxy (1-2 coats)/Urethane
Hy-Tech Thermal Solutions
METAL SHIELD
Calcium Sulphonate
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
International
Organic Zinc/Epoxy/Urethane
IXS Coatings/Ultimate Linings
Spray Foam
Polyurea Hybrid (1, 2, or 3 coats)
Jotun Paints Inc.
Resist 86 AV / Penguard Express / Hardtop AX
Inorganic Zinc/Epoxy/Urethane
Mascoat
MI-DTI
Alkyd/Acrylic/Acrylic
Maxon Technologies
CRS
Other
New Guard Coatings Inc.
Jotun/PPG
Other
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote PA II
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
Ply-Guard AS Polyaspartic
Polyurea Hybrid (1, 2, or 3 coats)
PPG
Amercoat
Epoxy (1-2 coats)/Urethane
Premier Coating Systems Inc
PCS-#1111/PCS-#4300
Epoxy (1-2 coats)/Fluoreurethane
Rhino Linings
Rhino SolarMax®
Urethane/Urethane
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
Macropoxy 646 FC Epoxy/Acrolon Ultra
Epoxy (1-2 coats)/Urethane
Specialty Polymer Coatings, Inc.
SP-2888 RG SP-1088
Epoxy (1-2 coats)/Urethane
Specialty Products, Inc. (SPI)
POLYSHIELD HT-100F w/AE-4, AMP 100, POLY SHIELD HT-SL
Polyurea Pure (1, 2, or 3 coats)
Stirling Lloyd Group Plc.
Integritank
Methyl Methacrylate/Methyl Methacrylate
Synavax, Inc.
Heat Shield EPX-H20
Thermal Spray
Termarust Technologies Inc.
Termarust TR2000 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
ThermaCote, Inc.
ThermaCote®: Other (less than 100 g/L)
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-GARD 258
Epoxy 100% Solids (1 or 2 Coats)
The Thortex Group
3M Scotchkote Epoxy Primer GP 120
Epoxy/Epoxy 100% solids
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
ZincGard/EpoxyGrip UreGrip
Organic Zinc/Epoxy/Urethane
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

WASTEWATER TREATMENT PLANTS, MUNICIPAL

tuachanwatthana / Getty Images

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EXTERIOR WEATHERING, UV, AND MILD CHEMICAL

3M Corrosion Protection Products
Scotchkote
Epoxy (1-2 coats)/Urethane
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR 1321
Epoxy 100% Solids (1 or 2 Coats)
Arma Coatings
Arma 901 Polyurea & Polyaspartic 6000
Polyurea Pure (1, 2, or 3 coats)
Atlas Minerals & Chemicals, Inc.
Rezklad
Epoxy 100% Solids (1 or 2 Coats)
Axalta
Corroless- Pipe in Pipe
Polyurea Hybrid (1, 2, or 3 coats)
Biome International
Biome
Epoxy 100% Solids (1 or 2 Coats)
Bowers Industrial
Gulf Coast Paint
Epoxy (1-2 coats)/Urethane
Carboline Company
Carbozinc/Carboxane
Organic Zinc/Siloxane
Chemline Inc
Chemline 3107
Urethane/Urethane
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
Cloverdale Paint Inc.
Armourshield
Epoxy (1-2 coats)/Urethane
Coatings For Industry, Inc.
U-Series
Urethane/Urethane
Cortec Corporation
VpCI 395/386
Epoxy (1-2 coats)/Acrylic (1-2 coats)
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Creative Polymers LLC
PlaThane 4950
Polyurea Hybrid (1, 2, or 3 coats)
Denso North America
Denso
Tape Wraps
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy (1-2 coats)/Urethane
Diamond Vogel Inc.
Iron Prime 600/Finium DTM-AT
Alkyd/Acrylic/Acrylic
Duromar, Inc.
HPL-1110 / HPL-1110
Epoxy 100% Solids (1 or 2 Coats)
East Earth Co., Ltd.
MAXBON
Epoxy/Vinyl Ester/Vinyl Ester
ENECON Corporation
CHEMCLAD
Epoxy/Epoxy 100% solids
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat RI 80 Flake Coating
Epoxy Flake Filled/Epoxy Flake Filled
Farwest Corrosion Control Company
3M and Denso
Epoxy/Epoxy 100% solids
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
RUSTOP/Silicone Poly Plus
Epoxy (1-2 coats)/Urethane
Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Goodwest Linings and Coatings
Carboline, Sherwin-Williams, Devoe
Organic Zinc/Epoxy/Urethane
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / CT-330 Acrylic Aliphatic Poly
Epoxy (1-2 coats)/Urethane
Hempel (USA), Inc.
Hempadur Series/Hempathane Series
Epoxy (1-2 coats)/Urethane
Heresite Protective Coatings, LLC
CSE-6200/UC-5500
Epoxy (1-2 coats)/Urethane
Highland International
475R Dry-Fall Epoxy Primer/ 688 Series Dry-Fall Uret
Epoxy (1-2 coats)/Urethane
H-I-S Coatings
H-I-S Coatings
Epoxy (1-2 coats)/Urethane
Hy-Tech Thermal Solutions
METAL SHIELD
Calcium Sulphonate
Induron Coatings, LLC
Induretnane 6600 Plus
Epoxy (1-2 coats)/Urethane
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
Insulating Coatings Corporation
Astec 2000 System
Alkyd/Acrylic/Acrylic
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
International
Epoxy/Epoxy/Siloxane
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ™
Tape Wraps

Jotun Paints Inc.
Resist 86 AV / Penguard Express / Hardtop AX
Inorganic Zinc/Epoxy/Urethane

Kaufman Products, Inc.
SurePoxy HiBild
Epoxy 100% Solids (1 or 2 Coats)

Lava-Liner
UF 6800
Urethane/Urethane

Linabond
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic

Mascoat
MI-DTI
Alkyd/Acrylic/Acrylic

Maxon Technologies
CRS
Other

Micor Company, Inc.
Micorthane 6-23
Urethane/Urethane

Milamar Coatings
ICO Rust Guard/PM-500
Epoxy/MCU/MCU

New Guard Coatings Inc.
Jotun/PPG
Other

Nukote Coating Systems International
Nukote PA II
Polyurea Pure (1, 2, or 3 coats)

Oak Ridge Foam & Coating Systems, Inc
Oak Ridge
Polyurea Pure (1, 2, or 3 coats)

Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)

Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane

Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)

Polyset
Ply-Guard UR (Polyurea)/Ply-Guard AS (Polyaspartic)
Polyurea Pure (1, 2, or 3 coats)

PPC Coatings (MTR)
PPC Coatings
Other

PPG
Amercoat
Epoxy (1-2 coats)/Urethane

Premier Coating Systems Inc
PCS-#1113/PCS-#4300
Epoxy (1-2 coats)/Fluorourethane

Quantum Chemical
Illustrium
Urethane Elastomeric (1 Coat)

Randolph Products
Randolph Products RP 75
Other

Rhino Linings
Rhino SolarMax®
Urethane/Urethane

Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)

Sherwin-Williams
Macropoxy 646 FC Epoxy / Acrolon Ultra
Epoxy (1-2 coats)/Urethane

Specialty Polymer Coatings, Inc.
SP-5885 SP-1088
Epoxy (1-2 coats)/Urethane

Specialty Products, Inc. (SPI)
POLYSHIELD HT100F w/AE-4, POLYSHIELD HT-SL w/AE-4, A
Polyurea Pure (1, 2, or 3 coats)

Stirling Lloyd Group Plc.
Integritank
Methyl Methacrylate/Methyl Methacrylate

Synavax, Inc.
Heat Shield PT
Thermal Spray

Termarust Technologies Inc.
Termarust TR2000 HR CSA series
Calcium Sulphonate

Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane

ThermaCote, Inc.
ThermaCote®: Other (less than 100 g/L)

Thermion
Thermion
Thermal Spray

The Thortex Group
3M Scotchkote Epoxy Primer GP120
Other

TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray

Tnemec Company, Inc.
Epoxoline/Endura-Shield
Epoxy (1-2 coats)/Urethane
U.S. Coatings, LLC
EpoxyGrip/UreGrip
Epoxy (1-2 coats)/Urethane
Valentus Specialty Chemicals
VSC
Organic Zinc/Epoxy/Urethane
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

INTERIOR EXPOSURE ENVIRONMENT

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-15
Epoxy 100% Solids (1 or 2 Coats)
Arma Coatings
Arma 6000 Polyurea
Polyurea Pure (1, 2, or 3 coats)
Atlas Minerals & Chemicals, Inc.
Chempruf
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Axalta
NAP-GARD
Fusion-Bonded Epoxy (1-2 coats)
Biome International
Biome
Epoxy 100% Solids (1 or 2 Coats)
Bowers Industrial
Duromar
Epoxy 100% Solids (1 or 2 Coats)
Carboline Company
Carboguard/Phenoline/Plasite
Epoxy/Epoxy/Epoxy
CCI Con-Tech of California, Inc.
HYDRO-POX
Epoxy/Epoxy 100% solids
Ceilcote (International Paint LLC)
Ceilcote/ Flakeline
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Chemline Inc
Chemline 4200
Urethane/Urethane
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
Cloverdale Paint Inc.
LifeLast
Urethane Elastomeric (1 Coat)
Coatings For Industry, Inc.
U-Series
Urethane/Urethane
Cortec Corporation
VpCI 386
Alkyd/Acrylic/Acrylic
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Denso North America
Denso
Tape Wraps
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy/Epoxy/Epoxy
Diamond Vogel Inc.
Iron Prime 600/Vers-Acryl 222
Alkyd/Acrylic/Acrylic
DuraSeal, LLC
DuraLine
Epoxy/Epoxy 100% solids
Duromar, Inc.
HPL-1110 / HPL-1110
Epoxy 100% Solids (1 or 2 Coats)
East Earth Co., Ltd.
MAXBON
Epoxy/Vinyl Ester/Vinyl Ester
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat SP2410 Series
Epoxy 100% Solids (1 or 2 Coats)
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
RUSTOP/SP-X Silicone Poly Plus
Epoxy (1-2 coats)/Urethane
Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic
Epoxy/Epoxy/Epoxy
Heresite Protective Coatings, LLC
Heresite CSE-6200
Epoxy/Epoxy/Epoxy
Highland International
14-HF Chem-Temp Hybrid Epoxy Novolac Lining
Epoxy Novolac (1 or 2 Coats)
H-I-S Coatings
H-I-S Coatings
Epoxy (1-2 coats)/Urethane
Induron Coatings, LLC
Perma-Clean II
Epoxy/Epoxy/Epoxy
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
Ceilcote
Epoxy Flake Filled/Epoxy Flake Filled
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track *
Tape Wraps
Jotun Paints Inc.
Penguard Express / Hardtop AX
Epoxy (1-2 coats)/Urethane
Lava-Liner
LIF ECO 5000
Urethane/Urethane
Linabond
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic
Maxon Technologies
CRS
Other
Micor Company, Inc.
Micorox 1882
Epoxy 100% Solids (1 or 2 Coats)
Milamar Coatings
2300 LS
Epoxy/Epoxy 100% solids
National Polymers Inc.
Private Label
Epoxy (1-2 coats)/Urethane
New Guard Coatings Inc.
Jotun/PPG
Other
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ARU
Other
Oak Ridge Foam & Coating Systems, Inc
Oak Ridge
Urethane/Urethane
Peerless Industrial Systems
epigem
Epoxy 100% Solids (1 or 2 Coats)
Plastic Maritime Corporation
Weaclon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
Ply-Guard UR Polyurea
Polyurea Pure (1, 2, or 3 coats)
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Epoxy (1-2 coats)/Acrylic (1-2 coats)
Premier Coating Systems Inc
PCS-#1111/PCS-#4300
Epoxy (1-2 coats)/Fluorourethane
Randolph Products
Randolph Products Randogrip Navy G
Other
REMA Corrosion Control, Inc.
CORDGARD
Epoxy 100% Solids (1 or 2 Coats)
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Epoxy 100% Solids (1 or 2 Coats)
Sherwin-Williams
Macropoxy 646 FC Epoxy/Macropoxy 646 FC Epoxy
Epoxy/Epoxy
Specialty Polymer Coatings, Inc.
SP-1853
Urethane Elastomeric (1 Coat)
Specialty Products, Inc. (SPI)
POLYSHIELD HT-100F w/AE-4, POLYSHIELD HT-SL w/AE-4,
Polyurea Pure (1, 2, or 3 coats)

Sprayroq
SprayShield Green 2
Urethane Elastomeric (1 Coat)
Stirling Lloyd Group Plc.
Permare
Other
Synavax, Inc.
Heat Shield PT
Thermal Spray
Termarust Technologies Inc.
Termarust TR2000 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Textured Coatings of America
Trim Cote
Alkyd/Acrylic/Acrylic
ThermaCote, Inc.
ThermaCote®: Other (less than 100 g/L)
Thermion
Thermion
Thermal Spray
The Thortex Group
3M Scotchkote Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Tnemec Company, Inc.
Epoxoline
Epoxy/Epoxy/Epoxy
U.S. Coatings, LLC
EpoxyGrip
Epoxy/Epoxy/Epoxy
Valentus Specialty Chemicals
VSC
Organic Zinc/Epoxy/Urethane
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

IMMERSION - WASTEWATER COLLECTION, PRIMARY TREATMENT, SECONDARY TREATMENT

3M Corrosion Protection Products
Scotchkote
Epoxy (1-2 coats)/Urethane
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR 5-20
Epoxy Novolac (1 or 2 Coats)
Arma Coatings
Arma 901 50D
Polyurea Pure (1, 2, or 3 coats)
Atlas Minerals & Chemicals, Inc.
Anchor-Lok
Sheet Lining, Thermoplastic
Axalta
NAP-GARD
Fusion-Bonded Epoxy (1-2 coats)
Biome International
Biome
Epoxy Novolac (1 or 2 Coats)
Bowers Industrial
Quest
Polyurea Hybrid (1, 2, or 3 coats)
Carboline Company
Reactamine
Urethane Elastomeric (1 Coat)
CCI Con-Tech of California, Inc.
HYDRO-POX
Epoxy/Epoxy 100% solids
Ceilcote (International Paint LLC)
Ceilcote/ Flakeline MR
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Chemline Inc
Chemline ARC
Polyurea Pure (1, 2, or 3 coats)
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
Cloverdale Paint Inc.
LifeLast
Urethane Elastomeric (1 Coat)
Cortec Corporation
VpCI 395/2026
Epoxy/Epoxy Novolac/Epoxy Novolac
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)

Creative Polymers LLC
PliaThane 4950
Polyurea Hybrid (1, 2, or 3 coats)
Denso North America
Denso
Tape Wraps
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy/Epoxy/Epoxy
Diamond Vogel Inc.
Mult-E-Poxy 180
Epoxy/Epoxy/Epoxy
Dudick, Inc.
Protecto-Coat
Epoxy/Vinyl Ester/Vinyl Ester
DuraSeal, LLC
DuraLine
Epoxy/Epoxy 100% solids
Duromar, Inc.
HPL-2510 / HPL-2510
Epoxy 100% Solids (1 or 2 Coats)
East Earth Co., Ltd.
MAXBON
Epoxy/Epoxy 100% solids
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat SP2000 Series
Epoxy Novolac (1 or 2 Coats)
Farwest Corrosion Control Company
Trenton
Tape Wraps
Flexcrete Technologies Ltd
Cementec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
Gemite Products Inc.
Fibre-Prime
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Goodwest Linings and Coatings
Blair, Polymeric, Rubber Source
Sheet Lining, Rubber
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / PC-590 Wet Surface Epoxy
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Heresite Protective Coatings, LLC
Heresite CSE-6200
Epoxy/Epoxy/Epoxy
Highland International
74 Chem-Temp Hybrid Epoxy Lining
Epoxy Novolac (1 or 2 Coats)
H-I-S Coatings
Rustoleum
Epoxy/Epoxy
Induron Coatings, LLC
PermaSafe 100 Ceramic Epoxy
Epoxy 100% Solids (1 or 2 Coats)
International Metalizing Corporation
Reddewil 888
Thermal Spray
International Paint LLC
Celcote
Epoxy Flake Filled/Epoxy Flake Filled
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jotun Paints Inc.
Marathon 1000 GF / Marathon 1000 GF
Epoxy Flake Filled/Epoxy Flake Filled
Key Resin Company/Flowcrete
Key Vinyl Ester
Vinyl Ester/Vinyl Ester/Vinyl Ester
Lava-Liner
UF RCIA/UF ECO 5000 / Ultra-Flex EP FG 300
Inorganic Zinc/Epoxy/Urethane
Lava-Liner
Ultra-Flex ECO 5000 / Ultra-Flex EP FG 300
Other
Linabond
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic
Maxon Technologies
CRS
Other
Milamar Coatings
2300 ES
Epoxy/Epoxy 100% solids
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-95LVH5
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Other
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
Ply-Guard UR Polyurea
Polyurea Pure (1, 2, or 3 coats)
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Epoxy/Epoxy Phenolic/Epoxy Phenolic
REMA Corrosion Control, Inc.
COROFLAKE
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Rhino Linings
HiChem™
Urethane Elastomeric (1 Coat)
Sauereisen, Inc.
Sauereisen
Urethane/Urethane

Sherwin-Williams
Sher-Glass FF
Epoxy Flake Filled/Epoxy Flake Filled
Specialty Polymer Coatings, Inc.
SP-9888
Epoxy Novolac (1 or 2 Coats)
Specialty Products, Inc. (SPI)
ULTRA BOND-100, POLYSHIELD HT-100F w/ AE-4, ElastaFL
Polyurea Pure (1, 2, or 3 coats)
Sprayroq
SprayWall
Urethane/Urethane
Stirling Lloyd Group Plc.
Integritank
Methyl Methacrylate/Methyl Methacrylate
Stonhard, a brand of The Stonhard Group
Stonchem 400
Polyurea Hybrid (1, 2, or 3 coats)
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
The Thortex Group
3M Scotchkote Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
Tnemec Company, Inc.
Epoxoline/Perma-Shield
Epoxy/Epoxy 100% solids
U.S. Coatings, LLC
GripLine
Epoxy 100% Solids (1 or 2 Coats)
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC Zero-VOC Galvanizing Compound
Zinc-rich, inorganic

IMMERSION - TERTIARY TREATMENT

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-20
Epoxy Novolac (1 or 2 Coats)
Arma Coatings
Arma 90A5 Polyurea
Polyurea Pure (1, 2, or 3 coats)
Atlas Minerals & Chemicals, Inc.
Anchor-Lok
Sheet Lining, Thermoplastic
Axalta
NAP-GARD
Fusion-Bonded Epoxy (1-2 coats)
Blome International
Blome
Epoxy/Epoxy Novolac/Epoxy Novolac
Bowers Industrial
Duromar
Epoxy/Epoxy 100% solids
Carboline Company
Phenoline/Plaside
Epoxy 100% Solids (1 or 2 Coats)
CCI Con-Tech of California, Inc.
HYDRO-POX
Epoxy/Epoxy 100% solids

Cellcote (International Paint LLC)
Cellcote/ Flakeline MR
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
Cloverdale Paint Inc.
ClovaLine
Epoxy/Epoxy 100% solids
Cortec Corporation
VpCI 395/2026
Epoxy/Epoxy Novolac/Epoxy Novolac
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy/Epoxy/Epoxy
Diamond Vogel Inc.
Cerami-Tar
Epoxy Coal Tar High Build (1 or 2 Coats)
DuraSeal, LLC
DuraLine
Epoxy/Epoxy 100% solids
Duromar, Inc.
HPL-2510 / HPL-2510
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat SP2000 Series
Epoxy Novolac (1 or 2 Coats)
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
Gemite Products Inc.
Gem-Cote EP 100
Epoxy 100% Solids (1 or 2 Coats)
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / PC-590 Wet Surface Epoxy
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Hempel (USA), Inc.
Hempaline Series
Epoxy 100% Solids (1 or 2 Coats)
Highland International
74 Chem-Temp Hybrid Epoxy Lining
Epoxy Novolac (1 or 2 Coats)
Induron Coatings, LLC
PermaSafe 100 Ceramic Epoxy
Epoxy 100% Solids (1 or 2 Coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
Cellcote
Epoxy Flake Filled/Epoxy Flake Filled
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jotun Paints Inc.
Marathon 1000 GF / Marathon 1000 GF
Epoxy Flake Filled/Epoxy Flake Filled
Key Resin Company/Flowcrete
Key 630, Key 633
Epoxy/Epoxy Novolac/Epoxy Novolac
Lava-Liner
Ultra-Flex ECO5000
Urethane Elastomeric (1 Coat)
Lava-Liner
Ultra-Flex ECO5000
Urethane/Urethane
Linabond
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic
Maxon Technologies
CRS
Other
Milamar Coatings
7300 LS
Epoxy/Epoxy 100% solids
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-95LVHS, NR-80LVHS
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
Ply-Guard UR Polyurea
Polyurea Pure (1, 2, or 3 coats)
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Epoxy Phenolic/Epoxy Phenolic/Epoxy Phenolic
REMA Corrosion Control, Inc.
CORDGARD
Epoxy 100% Solids (1 or 2 Coats)
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
Dura-Plate 235 PW
Epoxy/Epoxy/Epoxy
Specialty Polymer Coatings, Inc.
SP-9888
Epoxy Novolac (1 or 2 Coats)
Specialty Products, Inc. (SPI)
ULTRA BOND-100, POLYSHIELD HT-100F
Polyurea Pure (1, 2, or 3 coats)
Sprayroq
SprayWall
Urethane/Urethane
Stirling Lloyd Group Plc.
Integritank
Methyl Methacrylate/Methyl Methacrylate

Stonhard, a brand of The Stonhard Group
Stoncheм 400
Polyurea Hybrid (1, 2, or 3 coats)
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
The Thortex Group
3M Scotchkote Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
Tnemec Company, Inc.
Epoxoline
Epoxy/Epoxy/Epoxy
U.S. Coatings, LLC
GripLine
Epoxy 100% Solids (1 or 2 Coats)
VersaFlex Incorporated
ESS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

WATERFRONT, LOCK AND DAM INDUSTRY

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ONSHORE ATMOSPHERIC EXPOSURE - WEATHERING, UV, & AIRBORNE SALT

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane

Arma Coatings
Arma 901 & 6000
Polyurea Pure (1, 2, or 3 coats)

Bowers Industrial
Duromar
Epoxy/Epoxy 100% solids

Carboline Company
Carbozinc/Carboguard/Carboxane
Organic Zinc/Epoxy/Siloxane

Coatings For Industry, Inc.
U-Series
Epoxy (1-2 coats)/Acrylic (1-2 coats)

Cortec Corporation
VpCI 396Z/396/384
Organic Zinc/Urethane/Urethane

Cote-L Industries Inc.
Durabak18/durabak18 smooth
Urethane/Urethane

Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)

Daubert Cromwell
Nox Rust 1100G
Wax

Denso North America
Denso
Tape Wraps

Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Organic Zinc/Epoxy/Urethane

Diamond Vogel Inc.
Endrua-Zinc 768/Multi-E-Prime 500/Multi-Thane 330 or
Organic Zinc/Epoxy/Urethane

Duromar, Inc.
HPL-1110 / HPL-1110
Epoxy 100% Solids (1 or 2 Coats)

ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)

Eoncoat LLC
EonCoat
Other

ErgonArmor Novocoat
Novocoat RI 80, Alloy Filled Coating
Epoxy Flake Filled/Epoxy Flake Filled

Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)

FSC Coatings Inc.
RUSTOP/SP-X Silicone Poly Plus
Epoxy (1-2 coats)/Urethane

G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic

Gemite Products Inc.
Fibre-Prime
Other

Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)

Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / CT-370 Acrylic Aliphatic Poly
Epoxy (1-2 coats)/Urethane

Heresite Protective Coatings, LLC
Heresite VR-500/UC5500
Other

Highland International
Spray-Safe: 325R/475R/688R
Organic Zinc/Epoxy/Urethane

Hy-Tech Thermal Solutions
METAL SHIELD
Calcium Sulphonate

Induron Coatings, LLC
Induerthane 6600 Plus
Organic Zinc/Epoxy/Urethane

Industrial Solutions USA, LLC
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)

Insulating Coatings Corporation
Astec 2000 System
Alkyd/Acrylic/Acrylic

International Metallizing Corporation
Reddevil 888
Thermal Spray

International Paint LLC
International
Organic Zinc/Epoxy/Siloxane

IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)

Jessup Manufacturing Company
Jessup Safety Track *
Tape Wraps

Jotun Paints Inc.
Resist 86 AV / Jotacote Universal N10 / Hardtop AX
Inorganic Zinc/Epoxy/Urethane

Linabond
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic

Maxon Technologies
CRS
Other

Milamar Coatings
ICO Rust Guard/PM-500
Epoxy/MCU/MCU

New Guard Coatings Inc.
Jotun/PPG
Other

Nukote Coating Systems International
Nukote PA II
Polyurea Pure (1, 2, or 3 coats)

Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)

Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)

PPC Coatings (MTR)
PPC Coatings
Other

PPG
Amercoat
Epoxy (1-2 coats)/Urethane

Premier Coating Systems Inc
PCS-#1111/PCS-#4300
Epoxy (1-2 coats)/Fluorourethane

Randolph Products
Randolph Products Randogrip Navy G Non-Skid
Other

Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)

Sherwin-Williams
Galvpac Zinc / Macropoxy 646, Hi-Solids Polyu rethane
Organic Zinc/Epoxy/Urethane

Specialty Polymer Coatings, Inc.
SP-1864
Urethane Elastomeric (1 Coat)
Specialty Products, Inc. (SPI)
ULTRA BOND-100, ElastaFLEX HP UB, AMP 100
Polyurea Pure (1, 2, or 3 coats)
Stirling Lloyd Group Plc.
Integritank
Methyl Methacrylate/Methyl Methacrylate
Synavax, Inc.
Heat Shield High Heat
Thermal Spray
Termarust Technologies Inc.
Termarust TR2000 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane
ThermaCote, Inc.
ThermaCote®: Other (less than 100 g/L)
Thermion
Thermion
Thermal Spray
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
ZincGard/EpoxyGrip/UreGrip
Organic Zinc/Epoxy/Urethane
Watson Coatings, Inc.
Armor-Shield
Calcium Sulphonate
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

SPLASH ZONE EXPOSURE - WEATHERING, UV, FRESH OR SALTWATER SPLASH, & ABRASION

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
Arma Coatings
Arma 901 & 6000
Polyurea Pure (1, 2, or 3 coats)
Bowers Industrial
Duromar
Epoxy/Epoxy 100% solids
Carboline Company
Carboguard
Epoxy/Epoxy/Epoxy
Coatings For Industry, Inc.
U-Series
Epoxy (1-2 coats)/Urethane
Cortec Corporation
VpCI 396Z/396/384
Organic Zinc/Urethane/Urethane
Cote-L Industries Inc.
Durabak/durabak smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Denso North America
Denso
Other
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy/Epoxy/Epoxy
Duromar, Inc.
HPL-1110 / HPL-1110
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat SP2000 Series
Epoxy 100% Solids (1 or 2 Coats)
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
FSC Coatings Inc.
RUSTOP Aluminim Urethane
Urethane/Urethane
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Fibre-Prime
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / PC-590 Wet Surface Epoxy
Epoxy/Epoxy 100% solids
Heresite Protective Coatings, LLC
CSE-6200/UC-5500
Epoxy (1-2 coats)/Urethane
Highland International
Spray-Safe: 325R/475R/688R
Organic Zinc/Epoxy/Urethane
Induron Coatings, LLC
Indurethane 6600 Plus
MCU Zinc Rich/Epoxy/Urethane
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
International
Epoxy/Epoxy/Epoxy
IXS Coatings/Ultimate Linings
ULXT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jessup Manufacturing Company
Jessup Safety Track ®
Tape Wraps
Jotun Paints Inc.
Marathon 1000 GF / Marathon 1000 GF / Hard top AX
Epoxy (1-2 coats)/Urethane
Kaufman Products, Inc.
K Pro CRS
Epoxy 100% Solids (1 or 2 Coats)
Linabond
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic
Maxon Technologies
CRS
Other
Milamar Coatings
ICO Rust Guard/Fibercoat
Epoxy/Epoxy 100% solids
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-95LVHS, NR-80LVHS
Urethane/Urethane
NSP Specialty Products
NSP-120 HPEC High Build
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HRZS® Single Coat System
Zinc-rich, inorganic
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Epoxy 100% Solids (1 or 2 Coats)
Premier Coating Systems Inc
PCS-#1200TA
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
Randolph Products
Randolph Products Randogrip Navy G Non-Skid
Other
Rhino Linings
Rhino Extreme™
Polyurea Pure (1, 2, or 3 coats)
Sherwin-Williams
Dura-Plate 154
Epoxy/Epoxy/Epoxy
Specialty Polymer Coatings, Inc.
SP-1864
Urethane Elastomeric (1 Coat)
Specialty Products, Inc. (SPI)
POLYSHIELD HT w/AE-4, ElastaFLEX HP, AMP 100
Polyurea Pure (1, 2, or 3 coats)
Stirling Lloyd Group Plc.
Integritank
Methyl Methacrylate/Methyl Methacrylate
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Synavax, Inc.
Heat Shield EPX-H20
Thermal Spray
Termarust Technologies Inc.
Termarust TR2000 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane
ThermaCote, Inc.
ThermaCote®: Other (less than 100 g/L)
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-DUR 560
Epoxy/Epoxy 100% solids
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
ZincGard/GripLine
Organic Zinc/Epoxy 100% solids

Vector Corrosion Technologies
Galvanode Jacket
Other
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC Zero-VOC Galvanizing Compound
Zinc-rich, inorganic

IMMERSION EXPOSURE - SEAWATER

3M Corrosion Protection Products
Scotchkote
Fusion-Bonded Epoxy (1-2 coats)
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-30
Epoxy 100% Solids (1 or 2 Coats)
Arma Coatings
Arma 90A5
Polyurea Pure (1, 2, or 3 coats)
Bowers Industrial
Quest
Polyurea Hybrid (1, 2, or 3 coats)
Carboline Company
Reactamine
Urethane Elastomeric (1 Coat)
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
Cloverdale Paint Inc.
LifeLast
Urethane Elastomeric (1 Coat)
Coatings For Industry, Inc.
U-Series
Epoxy/Epoxy
CORCHEM Corporation of Texas
CORCHEM® 207
Epoxy 100% Solids (1 or 2 Coats)
Cortec Corporation
VpCI 395/395
Epoxy/Epoxy
Cote-L Industries Inc.
Durabak/durabak smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Denso North America
Denso
Other
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy/Epoxy/Epoxy
Diamond Vogel Inc.
Cerami-Tar
Epoxy Coal Tar High Build (1 or 2 Coats)
Duromar, Inc.
HPL-2530 / HPL-2510
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat SP2000 Series
Epoxy 100% Solids (1 or 2 Coats)
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Fibre-Prime
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / PC-990 Wet Surface Epoxy
Epoxy/Epoxy/Epoxy
Heresite Protective Coatings, LLC
Heresite CSE-6200
Epoxy Flake Filled/Epoxy Flake Filled
Highland International
74 Chem-Temp Hybrid Epoxy Lining
Epoxy Novolac (1 or 2 Coats)
Induron Coatings, LLC
PermaSafe 100 Ceramic Epoxy
Epoxy/Epoxy 100% solids
Industrial Solutions USA, LLC
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
International
Epoxy/Epoxy/Epoxy
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jotun Paints Inc.
Marathon 1000 GF / Marathon 1000 GF
Epoxy Flake Filled/Epoxy Flake Filled
Linabond
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic
Milamar Coatings
ICO Glaze
Epoxy/Epoxy 100% solids
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-95LVHS, NR-80LVHS
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HRZS® Single Coat System
Zinc-rich, inorganic
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Epoxy 100% Solids (1 or 2 Coats)
Randolph Products
Randolph Products RP 7175
Other
Rhino Linings
HiChem™
Urethane Elastomeric (1 Coat)
Sherwin-Williams
Targuard
Epoxy Coal Tar High Build (1 or 2 Coats)
Specialty Polymer Coatings, Inc.
SP-1386
Urethane Elastomeric (1 Coat)
Specialty Products, Inc. (SPI)
ULTRA BOND-100F w/AE-4, ElastaFLEX HP UB, AMP 100
Polyurea Pure (1, 2, or 3 coats)
Stirling Lloyd Group Plc.
Integritank
Methyl Methacrylate/Methyl Methacrylate
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-DUR 560
Epoxy 100% Solids (1 or 2 Coats)
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
MasticGrip
Epoxy Coal Tar/Epoxy Coal Tar
Vector Corrosion Technologies
Galvanode Jacket
Other
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

IMMERSION EXPOSURE - FRESHWATER

3M Corrosion Protection Products
Scotchkote
Fusion-Bonded Epoxy (1-2 coats)
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-38
Epoxy 100% Solids (1 or 2 Coats)
Arma Coatings
Arma 901 Polyurea
Polyurea Pure (1, 2, or 3 coats)
Bowers Industrial
Duromar
Epoxy/Epoxy 100% solids
Carboline Company
Reactamine
Urethane Elastomeric (1 Coat)
ChemCo Systems
CCS Marine Coating
Inorganic Zinc/Epoxy 100% solids
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
Cloverdale Paint Inc.
LifeLast
Urethane Elastomeric (1 Coat)
Coatings For Industry, Inc.
U-Series
Epoxy/Epoxy
CORCHEM Corporation of Texas
CORCHEM® 207
Epoxy 100% Solids (1 or 2 Coats)
Cortec Corporation
VpCI 396/395
Epoxy/Epoxy
Cote-L Industries Inc.
Durabak/durabak smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Denso North America
Denso
Other
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy/Epoxy/Epoxy
Diamond Vogel Inc.
766-E Vinyl
Other
Duromar, Inc.
HPL-1110 / HPL-1118
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat SP2410
Epoxy 100% Solids (1 or 2 Coats)
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
G.O.A. Enterprises - Agent for Chemco International Ltd.
Chemco International
Zinc-rich, organic
Gemite Products Inc.
Fibre-Prime
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / PC-590 Wet Surface Epoxy
Epoxy/Epoxy/Epoxy
Heresite Protective Coatings, LLC
Heresite CSE-6200
Epoxy/Epoxy/Epoxy
Highland International
Spray-Safe: 475R/475R/485R
Epoxy/Epoxy/Epoxy
Induron Coatings, LLC
PermaSafe 100 Ceramic Epoxy
Epoxy 100% Solids (1 or 2 Coats)
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
International
Epoxy/Epoxy/Epoxy
IXS Coatings/Ultimate Linings
UL XT 66
Polyurea Hybrid (1, 2, or 3 coats)
Jotun Paints Inc.
Marathon 1000 GF / Marathon 1000 GF
Epoxy Flake Filled/Epoxy Flake Filled
Kaufman Products, Inc.
K Pro UC Coating
Epoxy 100% Solids (1 or 2 Coats)
Linabond
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic
Milamar Coatings
ICO Rust Guard/Fibercoat
Epoxy/Epoxy 100% solids
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-95LVHS, NR-80LVHS
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HRZS® Single Coat System
Zinc-rich, inorganic
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Epoxy 100% Solids (1 or 2 Coats)
Randolph Products
Randolph Products RP 7175
Other
Rhino Linings
HiChem™
Urethane Elastomeric (1 Coat)
Sherwin-Williams
Dura Plate 235
Epoxy/Epoxy
Specialty Polymer Coatings, Inc.
SP-1386
Urethane Elastomeric (1 Coat)
Specialty Products, Inc. (SPI)
ULTRA BOND-100F, POLYSHIELD HT-100F w/AE-4, ElastaFL
Polyurea Pure (1, 2, or 3 coats)
Stirling Lloyd Group Plc.
Integritank
Methyl Methacrylate/Methyl Methacrylate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
Thin Film Technology, Inc.
BIO-DUR 560
Epoxy/Epoxy 100% solids
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
U.S. Coatings, LLC
MasticGrip
Epoxy Coal Tar/Epoxy Coal Tar
Vector Corrosion Technologies
Galvanode Jacket
Other
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

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EXTERIOR EXPOSURE - WEATHERING AND UV

Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane

Arma Coatings
Arma Polyaspartic Polyurea
Polyurea Pure (1, 2, or 3 coats)

Axalta
Alesta
Epoxy/Polyester/Polyester

Bowers Industrial
Gulf Coast Paint
Epoxy (1-2 coats)/Urethane

Carboline Company
Carbozinc/Carboxane
Organic Zinc/Siloxane

Cloverdale Paint Inc.
Armourshield
Epoxy (1-2 coats)/Urethane

Coatings For Industry, Inc.
U-Series
Epoxy (1-2 coats)/Acrylic (1-2 coats)

Cortec Corporation
VpCI 386
Alkyd/Acrylic/Acrylic

Cote-L Industries Inc.
Durabak18/durabak18 smooth
Urethane/Urethane

Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)

Denso North America
Denso
Tape Wraps

Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy (1-2 coats)/Urethane

Diamond Vogel Inc.
Finium DTM-AT
Other

Duromar, Inc.
HPL-1110 / HPL-1110
Epoxy 100% Solids (1 or 2 Coats)

East Earth Co., Ltd.
MAXBON
Epoxy (1-2 coats)/Urethane

ENECON Corporation
CHEMCLAD
Epoxy/Epoxy 100% solids

Eoncoat LLC
EonCoat
Other

ErgonArmor Novocoat
Novocoat RI-80 Alloy Flake Coating
Epoxy Flake Filled/Epoxy Flake Filled

Farwest Corrosion Control Company
Trenton
Tape Wraps

Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)

FSC Coatings Inc.
RUSTOPISP-X Silicone Poly Plus
Epoxy (1-2 coats)/Urethane

Gemite Products Inc.
Fibre-Prime
Other

Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)

Goodwest Linings and Coatings
Carboline, Sherwin-Williams, Devoe
Organic Zinc/Epoxy/Urethane

Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic / CT-370 Acrylic Aliphatic Poly
Epoxy (1-2 coats)/Urethane

Hempel (USA), Inc.
Hempadur Series/Hempathane Series
Epoxy (1-2 coats)/Urethane

Heresite Protective Coatings, LLC
CSE-6200/UC-5500
Epoxy (1-2 coats)/Urethane

Highland International
Spray-Safe: 475R/68R
Epoxy (1-2 coats)/Urethane

H-I-S Coatings
H-I-S Coatings
Epoxy (1-2 coats)/Urethane

Induron Coatings, LLC
Perma-Gloss
Organic Zinc/Epoxy/Urethane

Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)

Insulating Coatings Corporation
Astec 2000 System
Alkyd/Acrylic/Acrylic

International Metalizing Corporation
Reddevil 888
Thermal Spray

International Paint LLC
International
Organic Zinc/Epoxy/Urethane

IXS Coatings/Ultimate Linings
UL AL 6613
Polyurea Pure (1, 2, or 3 coats)

Jessup Manufacturing Company
Jessup Safety Track *
Tape Wraps

Jotun Paints Inc.
Resist 86 AV / Penguard Express / Hardtop AX
Inorganic Zinc/Epoxy/Urethane

Kemper System America, Inc.
Kemperol 2K-PUR
Urethane/Urethane

Linabond
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic

Maxon Technologies
CRS
Other

Milamar Coatings
ICO Rust Guard/PM-500
Epoxy/Polyester/Polyester

New Guard Coatings Inc.
Jotun/PPG
Other

Nukote Coating Systems International
Nukote PA II
Polyurea Pure (1, 2, or 3 coats)

Peerless Industrial Systems
epigen
Epoxy/Epoxy 100% solids
Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
WB HRZS® Single Coat System
Zinc-rich, inorganic
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Epoxy (1-2 coats)/Urethane
Premier Coating Systems Inc
PCS-#1111/PCS-#4300
Epoxy (1-2 coats)/Fluoropolyurethane
Quantum Chemical
Illustrium
Urethane Elastomeric (1 Coat)
Rhino Linings
Rhino SolarMax®
Urethane/Urethane
Sauereisen, Inc.
Sauereisen
Urethane/Urethane

Sherwin-Williams
Macropoxy 646 / Fluorokem HS
Epoxy (1-2 coats)/Urethane
Specialty Polymer Coatings, Inc.
SP-5885 SP-1088
Epoxy (1-2 coats)/Urethane
Specialty Products, Inc. (SPI)
POLYSHIELD HT-100F UB, AMP 100, Hard Cap-100
Polyurea Pure (1, 2, or 3 coats)
Stirling Lloyd Group Plc.
Integritank
Methyl Methacrylate/Methyl Methacrylate
Synavax, Inc.
Heat Shield High Heat
Thermal Spray
Ternarust Technologies Inc.
Ternarust TR2000 HR CSA series
Calcium Sulphonate
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Urethane
Textured Coatings of America
Clear Guard
Epoxy (1-2 coats)/Urethane
ThermaCote, Inc.
ThermaCote®: Other (less than 100 g/L)
Thermion
Thermion
Thermal Spray
The Thortex Group
3M Scotchkote
Epoxy/Epoxy/Epoxy
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
Tnemec Company, Inc.
Hydro-Zinc/Endura-Shield/Hydro®lon
Organic Zinc/Epoxy/Fluoropolymer
U.S. Coatings, LLC
EpoxyGrip/UrieGrip
Epoxy (1-2 coats)/Urethane
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Watson Coatings, Inc.
Armor-Shield
Calcium Sulphonate
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

IMMERSION EXPOSURE - POTABLE WATER APPROVED

3M Corrosion Protection Products
Scotchkote
Fusion-Bonded Epoxy (1-2 coats)
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-16
Epoxy 100% Solids (1 or 2 Coats)
Arma Coatings
Arma PW Polyurea
Polyurea Pure (1, 2, or 3 coats)
Axalta
NAP-GARD
Fusion-Bonded Epoxy (1-2 coats)
Bowers Industrial
Duromar
Epoxy 100% Solids (1 or 2 Coats)
Carboline Company
Carboguard
Epoxy/Epoxy/Epoxy
CCI Coo-Tech of California, Inc.
HYDRO-POX
Epoxy/Epoxy 100% solids
Chemline Inc
Chemline 4200
Urethane/Urethane
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
Cloverdale Paint Inc.
LifeLast
Urethane Elastomeric (1 Coat)
Cortec Corporation
VpCI 395/395
Epoxy/Epoxy
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy/Epoxy/Epoxy
Duromar, Inc.
HPL-1110 PW / HPL-1110-PW
Epoxy 100% Solids (1 or 2 Coats)
East Earth Co., Ltd.
MAXBON
Epoxy 100% Solids (1 or 2 Coats)
ENECON Corporation
CHEMCLAD
Epoxy/Epoxy Novolac/Epoxy Novolac
Enviroline (International Paint LLC)
Enviroline
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat SP2000 Series
Epoxy Novolac (1 or 2 Coats)
Flexcrete Technologies Ltd
Cementitious Coating 851
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Goodwest Linings and Coatings
3M Scotchkote 134
Fusion-Bonded Epoxy (1-2 coats)
Induron Coatings, LLC
Perma-Clean 100 Ceramic Epoxy
Epoxy 100% Solids (1 or 2 Coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
Devoe
Epoxy/Epoxy 100% solids
IXS Coatings/Ultimate Linings
UL AL 6613
Polyurea Pure (1, 2, or 3 coats)
Jotun Paints Inc.
Tankguard DW AV / Tankguard DW AV
Epoxy/Epoxy 100% solids
Linabood
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic
New Guard Coatings Inc.
Jotun/PPG
Other
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST pw
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyset
Ply-Guard UR (Potable Water) Polyurea
Polyurea Pure (1, 2, or 3 coats)
PPG
Amercoat
Epoxy 100% Solids (1 or 2 Coats)
Quantum Chemical
PRECIDIUM
Polyurea Pure (1, 2, or 3 coats)
Rhino Linings
Rhino Extreme™ PW
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
Macropoxy 646 PW
Epoxy/Epoxy
Specialty Polymer Coatings, Inc.
SP-7888 NSF
Epoxy 100% Solids (1 or 2 Coats)
Specialty Products, Inc. (SPI)
Watersafe Primer, WATERSAFE-UB, WATERSAFE II
Polyurea Pure (1, 2, or 3 coats)

Sprayroq
SprayShield Green 1
Urethane Elastomeric (1 Coat)
Stirling Lloyd Group Plc.
Permare
Other
Thermion
Thermion
Thermal Spray
Tnemec Company, Inc.
Hydro-Zinc/Epoxoline
Organic Zinc/Epoxy 100% solids
U.S. Coatings, LLC
GripLine
Epoxy/Epoxy 100% solids
VersaFlex Incorporated
AquaVers 405
Polyurea Pure (1, 2, or 3 coats)
Witt Lining Systems
Exceline PW PVC
Sheet Lining, Thermoplastic
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)

IMMERSION EXPOSURE - NON-POTABLE WATER

3M Corrosion Protection Products
Scotchkote
Fusion-Bonded Epoxy (1-2 coats)
Advanced Polymer Coatings (APC)
ChemLine
Siloxane/Siloxane
ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-15
Epoxy 100% Solids (1 or 2 Coats)
Arma Coatings
Arma 901 55D Polyurea
Polyurea Pure (1, 2, or 3 coats)
Atlas Minerals & Chemicals, Inc.
Rezklad
Epoxy 100% Solids (1 or 2 Coats)
Bowers Industrial
Duromar
Epoxy/Epoxy 100% solids
Carboline Company
Phenoline/Plasite
Epoxy 100% Solids (1 or 2 Coats)
CCI Con-Tech of California, Inc.
HYDRO-POX
Epoxy/Epoxy 100% solids
Ceilcote (International Paint LLC)
Ceilcote/ Flakeline
Epoxy/Epoxy Flake Filled/Epoxy Flake Filled
CIM Industries
CIM
Urethane Elastomeric (1 Coat)
Cloverdale Paint Inc.
Clovamastic
Epoxy/Epoxy
Coatings For Industry, Inc.
U-Series
Epoxy/Epoxy
Cortec Corporation
VpCI 395/395
Epoxy/Epoxy
Cote-L Industries Inc.
Durabak/durabak smooth
Urethane/Urethane
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Polyurea Pure (1, 2, or 3 coats)
Denso North America
Denso
Tape Wraps
Devoe High Performance Coatings (International Paint LLC)
Devoe High Performance Coatings
Epoxy/Epoxy/Epoxy
Diamond Vogel Inc.
Mult-E-Poxy 180
Epoxy/Epoxy/Epoxy
Duromar, Inc.
HPL-1110 / HPL-1110
Epoxy 100% Solids (1 or 2 Coats)
East Earth Co., Ltd.
MAXBON
Epoxy/Epoxy 100% solids
ENECON Corporation
CHEMCLAD
Epoxy/Epoxy 100% solids
Enviroline (International Paint LLC)
Enviroline
Epoxy 100% Solids (1 or 2 Coats)
Eoncoat LLC
EonCoat
Other
ErgonArmor Novocoat
Novocoat SP2000 Series
Epoxy Novolac (1 or 2 Coats)
Farwest Corrosion Control Company
Trenton
Tape Wraps
Flexcrete Technologies Ltd
Cemprotec
Epoxy (1-2 coats)/Acrylic (1-2 coats)
Gemite Products Inc.
Fibre-Prime
Other
Global EcoTechnologies
ENDURA-FLEX
Urethane Elastomeric (1 Coat)
Goodwest Linings and Coatings
Carboline 300M
Epoxy Coal Tar High Build (1 or 2 Coats)
Gulf Coast Paint Mfg., Inc.
CM-15 Epoxy Mastic
Epoxy/Epoxy/Epoxy
Hempel (USA), Inc.
Hempadur Series
Epoxy/Epoxy/Epoxy
Heresite Protective Coatings, LLC
Heresite CSE-6200
Epoxy/Epoxy/Epoxy
Highland International
14 Chem-Temp Hybrid Epoxy Lining
Epoxy Novolac (1 or 2 Coats)
H-I-S Coatings
Rustoleum
Epoxy/Epoxy
Induron Coatings, LLC
Perma-Clean 100 Ceramic Epoxy
Epoxy/Epoxy 100% solids
Industrial Solutions USA, LLC.
Nano-Clear Industrial Coating
Polyurea Hybrid (1, 2, or 3 coats)
International Metalizing Corporation
Reddevil 888
Thermal Spray
International Paint LLC
International
Epoxy/Epoxy/Epoxy
IXS Coatings/Ultimate Linings
UL AL 6613
Polyurea Pure (1, 2, or 3 coats)
Jotun Paints Inc.
Marathon 1000 GF / Marathon 1000 GF
Epoxy Flake Filled/Epoxy Flake Filled
Kemper System America, Inc.
Kemperol 2K-PUR
Urethane/Urethane
Lava-Liner
Ultra-Flex ECO5000
Urethane Elastomeric (1 Coat)
Linabond
SP Mastic Syst, Structural Polymer Syst, Simul form
Sheet Lining, Thermoplastic
Maxon Technologies
CRS
Other
Milamar Coatings
ICD Rust Guard/Fibercoat
Epoxy/Epoxy 100% solids
New Guard Coatings Inc.
Jotun/PPG
Other
Normac Adhesive Products Inc.
NR-95LVHS, NR-80LVHS
Urethane/Urethane
NSP Specialty Products
NSP-120 High Performance Epoxy Coating
Epoxy 100% Solids (1 or 2 Coats)
Nukote Coating Systems International
Nukote ST
Polyurea Pure (1, 2, or 3 coats)
Peerless Industrial Systems
epigen
Epoxy 100% Solids (1 or 2 Coats)
Plastic Maritime Corporation
Wearlon
Epoxy/Epoxy/Siloxane
Polibrid Coatings, Inc.
Polibrid 705E
Urethane Elastomeric (1 Coat)
Polyguard Products, Inc.
RD-6 Coating
Tape Wraps
Polyset
WB HRZS® Single Coat System
Zinc-rich, inorganic
PPC Coatings (MTR)
PPC Coatings
Other
PPG
Amercoat
Epoxy/Epoxy/Epoxy
Quantum Chemical
PRECIDIUM
Polyurea Pure (1, 2, or 3 coats)
Rhino Linings
Rhino Linings TuffGrip®
Polyurea Pure (1, 2, or 3 coats)
Sauereisen, Inc.
Sauereisen
Urethane/Urethane
Sherwin-Williams
Macropoxy 646 PW
Epoxy/Epoxy
Specialty Polymer Coatings, Inc.
SP-2888 RG
Epoxy 100% Solids (1 or 2 Coats)
Specialty Products, Inc. (SPI)
AQUASEAL, POLYSHIELD HT-SL w/AE-4, ULTRA BOND-100, P
Polyurea Pure (1, 2, or 3 coats)
Sprayroq
SprayShield Green 1
Urethane Elastomeric (1 Coat)

Stirling Lloyd Group Plc.
Integritank
Methyl Methacrylate/Methyl Methacrylate
Subsea Industries NV
Ecospeed
Vinyl Ester/Vinyl Ester/Vinyl Ester
Tesla NanoCoatings, Inc.
Teslan
Organic Zinc/Epoxy/Epoxy
Thermion
Thermion
Thermal Spray
TMS Metalizing Systems, Ltd.
TMS Metalizing Systems
Thermal Spray
Tnemec Company, Inc.
Hydro-Zinc/Epoxoline
Organic Zinc/Epoxy/Epoxy
U.S. Coatings, LLC
GripLine
Epoxy Novalac (1 or 2 Coats)
VersaFlex Incorporated
FSS 50 DM
Polyurea Pure (1, 2, or 3 coats)
Zebron Corporation
Zebron 386
Urethane Elastomeric (1 Coat)
ZRC Worldwide
ZRC-221 Cold Galvanizing Compound
Zinc-rich, organic

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ANTI-GRAFFITI

Axalta
Alesta- Spotless
Epoxy/Urethane (color)/Urethane (clear)
Cloverdale Paint Inc.
83953 Armourshield
Epoxy/Urethane (color)/Urethane (clear)
Coatings For Industry, Inc.
U-Series
Organic Zinc/Epoxy/Urethane (color & clear)
Cortec Corporation
VpCI 395/384
Epoxy/Urethane (color)/Urethane (clear)
FSC Coatings Inc.
RUSTOP/Graffiti Max
Epoxy/Urethane (color)/Urethane (clear)
Gulf Coast Paint Mfg., Inc.
CT-352 Polyester Polyurethane
Epoxy/Urethane (color)/Urethane (clear)
Highland International
74-NS Anti-Graffiti Non-Stick Coating
Epoxy (1-2 coats)/Fluoropolymer
H-I-S Coatings
H-I-S Coatings
Epoxy/Urethane (color)/Urethane (clear)
Induron Coatings, LLC
Indurethane AG
Epoxy/Urethane (color)/Urethane (clear)
Industrial Solutions USA, LLC.
Nano-Clear Industrial Fluoropolymer Coating
Epoxy/Urethane (color)/Urethane (clear)
New Guard Coatings Inc.
Jotun/PPG/Rust-Oleum
Epoxy/Urethane (color)/Urethane (clear)
Nukote Coating Systems International
Nukote Stainguard
Epoxy/Urethane (color)/Urethane (clear)
Plastic Maritime Corporation
Wearlon
Epoxy/Urethane (color)/Urethane (clear)
Precision Coatings Inc.
DTM1300/PC1Anti-Graffiti
Epoxy/Urethane (color)/Urethane (clear)
Sherwin-Williams
Macropoxy 646 / 2K WB Urethane Antigraffiti
Epoxy/Urethane (color)/Urethane (clear)
Textured Coatings of America
GRAFFITI GARD
Epoxy/Urethane (color)/Urethane (clear)
Tnemec Company, Inc.
Epoxoline/Fluoronar
Epoxy (1-2 coats)/Fluoropolymer
US Coating Solutions
AGS Anti-Graffiti
Epoxy/Urethane (color)/Urethane (clear)
VersaFlex Incorporated
WBS 250
Organic Zinc/Urethane (color)/Urethane (clear)

FIRE-RESISTIVE COATINGS FIRE RESISTANCE UP TO 4 HOURS (UL1709 RATING)

Albi Mfg. A Division of StanChem Inc.
Albi Clad 800
Thin-Film Intumescent
Carboline Company
Thermo-Lag
Thick-Film Intumescent
Cote-L Industries Inc.
ceasefire
Thin-Film Intumescent
International Paint LLC
International
Thick-Film Intumescent
Isolatek International
CAFCO FENDOLITE M-II/P
Cementitious
Jotun Paints Inc.
Jotachar 1709
Thick-Film Intumescent
Nukote Coating Systems International
Nukote FR
Thick-Film Intumescent
Plastic Maritime Corporation
Wearlon
Thin-Film Intumescent
Sherwin-Williams
FIRETEX
Thick-Film Intumescent

FIRE-RESISTIVE COATINGS FIRE RESISTANCE FROM 1 TO 2 HOURS (UL1709 RATING)

Albi Mfg. A Division of StanChem Inc.
Albi Clad TF
Thin-Film Intumescent
Carboline Company
Pyrocrete
Cementitious
Cote-L Industries Inc.
ceasefire
Thin-Film Intumescent
East Earth Co., Ltd.
MAXBON
Thick-Film Intumescent
Fire Free Coatings Inc.
FF88+
Thick-Film Intumescent
International Paint LLC
International
Thick-Film Intumescent
Isolatek International
CAFCO FENDOLITE M-II/P
Cementitious
Jotun Paints Inc.
Jotachar 1709
Thick-Film Intumescent
Nukote Coating Systems International
Nukote FR
Thick-Film Intumescent
Plastic Maritime Corporation
Wearlon
Thin-Film Intumescent
Sherwin-Williams
FIRETEX
Thin-Film Intumescent
Thin Film Technology, Inc.
FIRE-NOT 451
Thin-Film Intumescent

HEAT-RESISTANT COATINGS DRY HEAT RESISTANCE FROM 201 F TO 450 F (99 C TO 233 C)

Advanced Polymer Coatings (APC)
ChemLine
Silicone Modified/Silicone Modified
Axalta
Alesta- Hi Temp
Silicone Modified/Silicone Modified
Carboline Company
Thermaline
Novolac Epoxy/Novolac Epoxy
Cloverdale Paint Inc.
silicone alkyd
Alkyd Modified/Alkyd Modified

Coatings For Industry, Inc.
Siloxseal
Silicone Modified/Silicone Modified
Cortec Corporation
VpCI 371
Silicone Modified/Silicone Modified
Creative Material Technologies, Ltd.
THERMAL-SOLV(TM)
Inorganic Zinc-Rich
Dampney Co., Inc.
Thurmalox
Silicone Modified/Silicone Modified
Diamond Vogel Inc.
Cote-All
Silicone Modified/Silicone Modified
ErgonArmor Novocoat
Novocoat SC5400 Series
Novolac Epoxy/Novolac Epoxy
FSC Coatings Inc.
RUSTOP Maximum/SP-X Silicone Poly Plus
Silicone Modified/Silicone Modified
Hempel (USA), Inc.
Hempadur Series
Epoxy Phenolic/Epoxy Phenolic
Highland International
802/815 Custom Colors Available
Silicone Modified/Silicone Modified
H-I-S Coatings
H-I-S Coatings
Silicone Unmodified/Silicone Unmodified
Hy-Tech Thermal Solutions
AL-2402
Alkyd Modified/Alkyd Modified
International Paint LLC
International
Epoxy Phenolic/Epoxy Phenolic
Jotun Paints Inc.
Solvalitt Midtherm / Solvalitt Midtherm
Silicone Modified/Silicone Modified
New Guard Coatings Inc.
Jotun/PPG
IOZinc Rich Primer/Silicone Modified
Nukote Coating Systems International
Nukote Chemshield
Epoxy Ester/Epoxy Ester
Peerless Industrial Systems
Epigen
Epoxy Phenolic/Epoxy Phenolic
Randolph Products
Randolph Products High Heat Aluminum TT-P-28
Silicone Modified/Silicone Modified
Sherwin-Williams
Epo-Phen / Epo-Phen
Novolac Epoxy/Novolac Epoxy
Specialty Polymer Coatings, Inc.
SP-8888
Novolac Epoxy/Novolac Epoxy

HEAT-RESISTANT COATINGS DRY HEAT RESISTANCE FROM 451 F TO 800 F (234 C TO 427 C)

Axalta
Alesta- Hi Temp
Silicone Modified/Silicone Modified
Carboline Company
Carbozinc/Thermaline
IOZinc Rich Primer/Silicone Unmodified
Cloverdale Paint Inc.
Clovatherm
IOZinc Rich Primer/Silicone Modified
Coatings For Industry, Inc.
Siloxseal
Silicone Unmodified/Silicone Unmodified
Cortec Corporation
VpCI 371
Silicone Modified/Silicone Modified
Creative Material Technologies, Ltd.
THERMAL-SOLV(TM)
Inorganic Zinc-Rich
Dampney Co., Inc.
Thurmalox
IOZinc Rich Primer/Silicone Modified
Diamond Vogel Inc.
Cote-All
Silicone Modified/Silicone Modified
FSC Coatings Inc.
RUSTOP Maximum/SP-X Silicone Poly Plus
Silicone Modified/Silicone Modified
Hempel (USA), Inc.
Galvosil Series/Hempel's Silicone Series
IOZinc Rich Primer/Silicone Unmodified
Highland International
Spray-Safe: 827-HB 1200F Multipolymeric Matrix DTM
Silicone Modified/Silicone Modified
H-I-S Coatings
H-I-S Coatings
Silicone Unmodified/Silicone Unmodified
Hy-Tech Thermal Solutions
AL-2402
Alkyd Modified/Alkyd Modified
International Paint LLC
International
Inorganic Zinc-Rich
Jotun Paints Inc.
Resist 86 AV / Solvalitt
IOZinc Rich Primer/Silicone Modified
New Guard Coatings Inc.
Jotun/PPG
Silicone Modified/Silicone Modified
Peerless Industrial Systems
Epigen
Epoxy Phenolic/Epoxy Phenolic
Randolph Products
Randolph Products High Heat Aluminum TT-P-28
Silicone Modified/Silicone Modified
Sherwin-Williams
Heat-Flex Hi-Temp 1000
Silicone Modified/Silicone Modified

HEAT-RESISTANT COATINGS DRY HEAT RESISTANCE FROM 801 F TO 1200 F (428 C TO 649 C)

Axalta
Alesta- Hi Temp
Silicone Modified/Silicone Modified
Carboline Company
Carbozinc/Thermaline
IOZinc Rich Primer/Silicone Unmodified
Cloverdale Paint Inc.
Clovazinc
IOZinc Rich Primer/Silicone Modified
Coatings For Industry, Inc.
Siloxseal
Silicone Unmodified/Silicone Unmodified
Cortec Corporation
VpCI 371
Silicone Modified/Silicone Modified
Creative Material Technologies, Ltd.
THERMAL-SOLV(TM)
Silicone Modified/Silicone Modified
Dampney Co., Inc.
Thurmalox
Silicone Modified/Silicone Modified
Diamond Vogel Inc.
Cote-All
Silicone Modified/Silicone Modified
Hempel (USA), Inc.
Hempel's Silicone Series
Silicone Unmodified/Silicone Unmodified
Highland International
Spray-Safe: 827-HB 1200F Multipolymeric Matrix DTM
Silicone Modified/Silicone Modified
H-I-S Coatings
H-I-S Coatings
Silicone Unmodified/Silicone Unmodified
International Paint LLC
international
Silicone Modified/Silicone Modified
Jotun Paints Inc.
Jotatemp 1000 Ceramic / Jotatemp 1000 Ceramic
Silicone Modified/Silicone Modified
New Guard Coatings Inc.
Jotun/PPG
Silicone Modified/Silicone Modified
Randolph Products
Randolph Products High Heat Aluminum TT-P-28
Silicone Modified/Silicone Modified

Sherwin-Williams
Heat-Flex Hi-Temp 1200
Silicone Modified/Silicone Modified

HEAT-RESISTANT COATINGS UNDER INSULATION, WET HEAT RESISTANCE UP TO 300 F (149 C)

Axalta
Alesta Hi Temp
Silicone Modified/Silicone Modified
Carboline Company
Thermaline
Epoxy Phenolic/Epoxy Phenolic
Cloverdale Paint Inc.
Clovaliee
Novolac Epoxy/Novolac Epoxy
Cortec Corporation
VpCI 2026/2026
Novolac Epoxy/Novolac Epoxy
Creative Material Technologies, Ltd.
THERMAL-SOLV(TM)
Silicone Modified/Silicone Modified
Dampney Co., Inc.
Thurmalox
Silicone Modified/Silicone Modified
ErgonArmor Novocoat
Novocoat SC5400 Series
Novolac Epoxy/Novolac Epoxy
FSC Coatings Inc.
RUSTOP Maximum/SP-X Silicone Poly Plus
Silicone Modified/Silicone Modified
Hempel (USA), Inc.
Hempadur Series
Epoxy Phenolic/Epoxy Phenolic

Highland International
74 Chem-Temp Hybrid Epoxy Lining
Novolac Epoxy/Novolac Epoxy
H-I-S Coatings
H-I-S Coatings
Silicone Unmodified/Silicone Unmodified
Jotun Paints Inc.
Jotatem 250 / Jotatem 250
Novolac Epoxy/Novolac Epoxy
Milamar Coatings
1550 HT
Novolac Epoxy/Novolac Epoxy
New Guard Coatings Inc.
Jotun/PPG
Epoxy Phenolic/Epoxy Phenolic
Nukote Coating Systems International
Nukote Chemshield
Epoxy Ester/Epoxy Ester
Peerless Industrial Systems
Epigen
Epoxy Phenolic/Epoxy Phenolic
Sherwin-Williams
Heat-Epo-Phen
Novolac Epoxy/Novolac Epoxy
Specialty Polymer Coatings, Inc.
SP-8888
Novolac Epoxy/Novolac Epoxy
Synavax, Inc.
Heat Shield EPX-H20
Epoxy Ester/Epoxy Ester

ANTIFOULANT AND FOULANT RELEASE COATINGS

ARCOR - Novolac Epoxy Technologies Inc
ARCOR S-30C
Coventional (Copper Biocide)
Carboline Company
C-Flex
Fouling Release
Creative Material Technologies, Ltd.
DYNA-PUR(TM)
Fouling Release
Hempel (USA), Inc.
Hempasil and Hempaguard
Fouling Release
Hempel A/S
Hempaguard
Fouling Release
International Metalizing Corporation
Reddevil 888
Coventional (Copper Biocide)
International Paint LLC
International
Fouling Release
Jotun Paints Inc.
SeaLion Repulse
Fouling Release
Linabond
SeaSkin(tm)
Fouling Release
Lonza
Copper Omadine
Coventional (Copper Biocide)
Plastic Maritime Corporation
Wearlon
Fouling Release
Sherwin-Williams
Seaguard 5000HS / Copperr Bottom AF 45
Coventional (Copper Biocide)
Specialty Products, Inc. (SPI)
POLYSHIELD HT-100F s/AE-4, POLYSHIELD HT-5L w/AE-4
Fouling Release
Thin Film Technology, Inc.
BIO-TUFF 592
Fouling Release

BUYING GUIDE PROFILES

3

3L&T INC.
897 Independence Ave. #18
Mountain View, CA 94043
Contact: Linas Mazeika
Phone: 650-625-0177
linas@3l-t.com
3l-t.com

3M CORROSION PROTECTION PRODUCTS
6801 River Place Blvd., 130-4N-01
Austin, TX 78726
Contact: customer service
Phone: 800-722-6721
mklatham@mmm.com
3m.com/corrosion

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ACRYLICON FLOORING SOLUTIONS
12460 Crabapple Rd., Ste. 202-106
Alpharetta, GA 30004
Contact: Jason Bye
Phone: 888-736-7550
jasonbye@acryliconusa.com
acryliconpolymers.com

ADVANCED POLYMER COATINGS (APC)
951 Jaycox Rd. P.O. Box 369
Avon, OH 44011
Contact: Kevin Balaban
Phone: 800-334-7193
kbalaban@adv-polymer.com
adv-polymer.com

AEGION COATING SERVICES
10655 Jefferson Chemical Rd
Conroe, TX 77301
Contact: Kyle Horvath
Phone: 281-598-6319
kyleh@aegion.com
aegion.com

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1 to <3 mils

The approximate reduction in surface profile achieved when surfaces with too deep a profile were re-blasted with a smaller abrasive.

See page 10.

1 mil/year

The amount of thickness loss of epoxy and aromatic polyurethane coatings applied above 20 mils dry film thickness in corrosive soil conditions.

See page 38.

1960s

The time period when the first commercial IR-TI cameras came into use, employing heat given off by an object to help locate said object.

See page 22.

73%

Percentage of PaintSquare Poll respondents who believe that events such as the recent conversion of a Massachusetts coal-and-oil plant to a solar farm will become more commonplace as the demand for renewable energy continues to increase.

See page 7.

30 days

The deadline before which a large-quantity hazardous waste generator must notify the EPA or state regulatory agency after closing its entire facility, such as at the end of a field painting project.

See page 15.

1K

One of the benefits of a vinyl-silane clearcoat — in addition to having a much longer pot life and faster hardness development — compared to a commercial 2K PU coating.

See page 28.