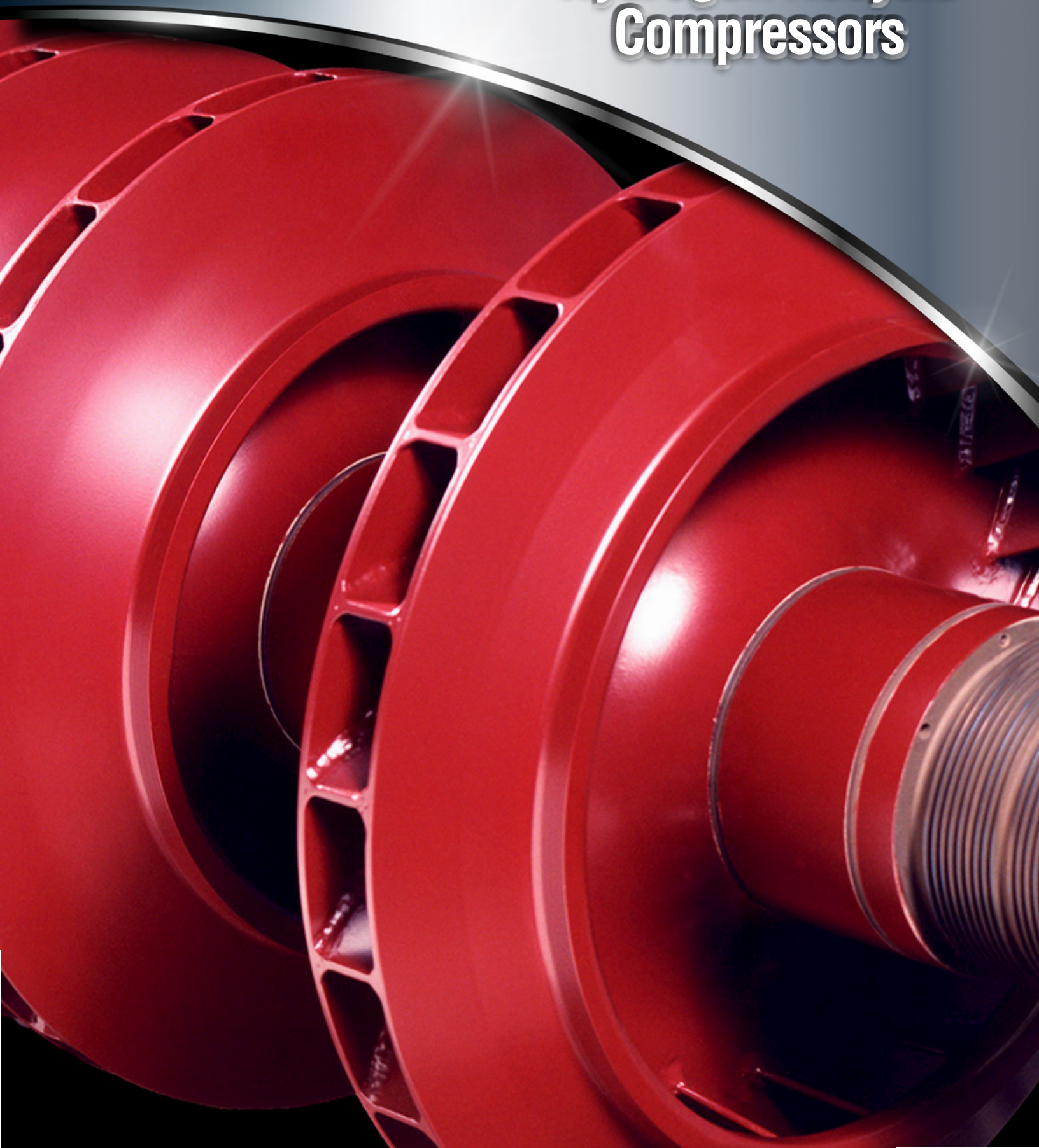
ELLIOTT GROUP
EBARA CORPORATION

Specialty Coating for Hydrogen Recycle Compressors



A Targeted Approach to Fouling Prevention for Compressors in Hydrogen Recycle Service

Centrifugal compressors in hydrogen recycle service operate in environments that present unique corrosion and fouling challenges. Salts, such as ammonium chloride, carried over from upstream processes adhere to metallic surfaces and reduce compressor efficiency over time. Underneath the ammonium chloride deposits, pitting corrosion can occur rapidly on carbon and stainless steel components, creating perfect initiation sites for fatigue cracks. If not addressed, this can eventually result in operating issues or even equipment failure.

Elliott has developed Pos-E-Coat® Protect, a specialty coating that is specifically designed to protect your hydrogen recycle compressors from these potentially catastrophic issues. Applying the coating to your rotor assemblies and diaphragms provides fouling and corrosion resistance, prevents corrosion pitting of critical compressor components, and helps to maintain operational efficiency.

Pos-E-Coat Protect is recommended for both new hydrogen recycle compressors and existing compressors in service. We can apply the coating once the compressor is taken offline, or we can apply it to your spare rotors, impellers, and diaphragms prior to a scheduled outage, shutdown, or turnaround.



Types of Fouling

Internally generated fouling in hydrocarbon recycle compressors occurs when process gas polymerizes inside the compressor and condenses polymeric materials on the flow surfaces. Hydrocarbon fouling is problematic and in some cases, it can be astonishing, as shown in Figure 1.



Figure 1. Foulant with tar-like consistency oozing from compressor.

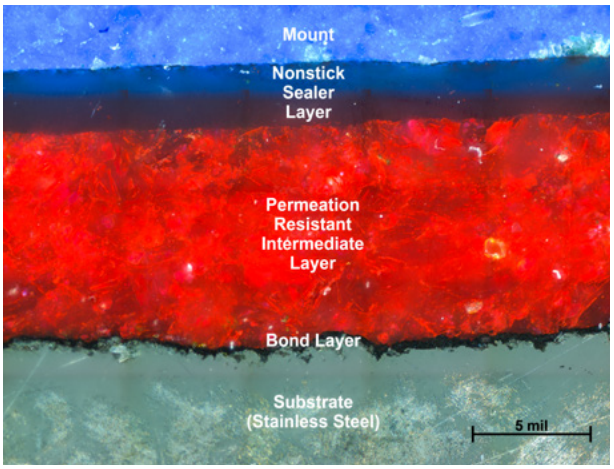
Foulant can also originate as carryover from upstream processes, which is different than internally generated foulant. Figure 2 shows the buildup of chloride salts carried into a hydrogen recycle compressor. These salts restrict flow passages and can also cause severe under deposit corrosion.



Figure 2. Fouling damage caused by salt carryover.

Proven Performance

Although standard compressor coatings have traditionally focused on minimizing fouling, none of them have been designed and tested specifically for hydrogen recycle compressors, until now. Our dedicated team of metallurgists and researchers formulated Pos-E-Coat Protect to safeguard against ammonium chloride carryover associated with the hydrogen recycle service.



The Elliott team performed rigorous tests and assessed the potential of chlorides adhering to the coating over time, corrosion resistance, and the durability of the coating against solid particle erosion. Our hydrogen recycle compressor coating significantly outperformed standard industry coatings in every category.

- Chlorides did not adhere to the surfaces after 1000+ spray/dry cycles of saturated solutions.
- The coating acted as a perfect corrosion barrier without the risk of setting up a galvanic corrosion cell.
- The coating was 10 times more durable than the industry standard coating in abrasion testing.

Features

- Our specially formulated coating is proven to provide advanced protection against ammonium chloride attacks, unlike the industry-standard aluminum-filled cermet base coating.
- Bond strength is at least five times stronger than required.
- Fouling resistance is maintained as the coating wears. The industry standard coating loses it antifouling resistance once the top coating is worn through.

Benefits

- Developed specifically for hydrogen recycle compressors.
- Proven to protect critical components from fouling and corrosion.
- Maintains compressor performance over a longer period of time.
- Turnarounds may be easier since cleaning may be minimized.

Protect Your Investment

Typical methods to prevent fouling include either injecting a liquid into the compressor to control temperatures and to aid in cleaning the flow surfaces, and/or applying a coating with anti-stick properties to critical components. Injecting a water wash or a solvent, such as Naptha, through a hydrogen recycle compressor to eliminate the ammonium chloride can be problematic. Ammonium chloride has low solubility in solvents, making it difficult to get the flow surfaces completely clean. Conversely, ammonium chloride has very high solubility in water, but a water wash requires great care to dilute the ammonium chloride. It is critical to remove all of it from the system or it will amplify corrosion. Pos-E-Coat Protect, when applied to rotors, impellers, and diaphragms, is the optimal solution to minimize fouling and corrosion of critical components in hydrogen recycle compressors.

Contact us today to learn more. Complete our online form to request more information:

elliott-turbo.com/aftermarketservices



Elliott Group is a global leader in the design, manufacture, and service of technically advanced centrifugal compressors, steam turbines, power recovery expanders, cryogenic pumps and expanders, and axial compressors used in the petrochemical, refining, oil & gas, liquefied gas, and process industries, as well as in power applications.

Elliott Group is a wholly owned subsidiary of Ebara Corporation, a major industrial conglomerate headquartered in Tokyo, Japan.

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