

NHE corrosion liner cleared for take off at Lufthansa Technik

When Lufthansa Technik Landing Gear Services UK, one of the world's leading commercial aircraft repair and overhaul businesses, needed to reline its chromium plating tank, it turned to NHE.

Specialists in the design, manufacture, installation and management of process plant for surface treatment, NHE provided a lining solution which was far superior to conventional liners for both corrosion resistance and lifespan.

The Problem

Lufthansa Technik's landing gear repair and overhaul facility in Middlesex uses Electrolytic Hard Chrome (EHC) plating to improve the wear resistance of landing gear components such as axles, inner cylinders, pins, journals and lug bores.

This process requires the use of chromium plating baths, or tanks, which contain hexavalent chromium and chromic acid (hex-Cr), a carcinogenic chemical mix which is highly corrosive to concrete and other unprotected substrate materials.

The containment of hexavalent chromium and chromic acid is highly regulated under UK law. The specification of any anti-corrosion system designed for the containment of this chemical must be of the highest standards in order to protect the environment and Lufthansa employees.

The tank in question is imperative to the overhaul of landing gear entering the facility. It stands at 16 feet deep and six feet square, which makes it the largest tank on site. The company overhauls and repairs around 30 landing gears per month, all year-round and around 60% of those will have a component which needs hard chrome plating in this tank, meaning it is in constant use.

Historically, Lufthansa Technik had used conventional tank lining systems which were replaced every two years at recurring investment of around £20,000 each time. This proved to be a cost intensive maintenance schedule, incurring a week of tank downtime during each liner replacement.

The Solution

Determined to find a more resilient liner which would last longer and decrease downtime, the team employed the services of NHE which, after conducting a comprehensive site inspection and requirement analysis, recommended a Koroseal® lining and LFP CrossFilm skirt™ from world-renowned manufacturer, Witt Liners.

As the sole supplier of Witt Liners in the UK, NHE had the specification and installation expertise required to deliver a new, highly corrosion-resistant lining solution. With an expected longer service life when in use up to five times longer than the previous liner existed.

“ The solution that they have provided not only outperforms our previous lining, but promises greatly improved life expectancy, simple maintenance and subsequent cost and time efficiencies.”

Peter Ayeni
Lean Manager,
Lufthansa Technik

- Superior acid and alkali protection from corrosion to tank
- Reduced maintenance cost and downtime
- Improved chemical containment safety
- Custom made lining perfectly fits tank in one piece
- Liner installed by NHE engineers well within timescales
- Lasts up to 5x longer than previous liner

With a track record of superior performance spanning more than three decades, Koroseal® PVC has been specifically designed for highly-corrosive environments which handle acids, alkalis and salts.

For chromic acid applications in particular, the Koroseal® lining has been rated either A1 or A2 for performance in the containment of chromic acid ranging in strength between 5% and 30%*.

It has an upper operating temperature of 93°C (200°F) and can be fabricated using Witt Lining's drop-in liner technology rather than the traditional bonding method - eradicating the need for time and cost intensive tank shot blasting.

LFP CrossFilm skirt – a second line of defence

For hard chrome plating environments, NHE recommends a secondary line of corrosion defence to achieve that all important longer product life span. The Witt Lining LFP skirt is chemically inert and therefore superior to its traditional sacrificial PVC counterparts.

The skirt covers the Koroseal® lining at the upper and lower solution levels of the tank where there is a concentration of chrome vapour. This vapour condensates in the freeboard area and attacks the tank lining, reducing service life and increasing tank downtime.

Traditional PVC skirts act as a sacrificial protective layer for the full tank liner and would require regular replacement, but a skirt made from LFP wouldn't degrade with time – eliminating the risk of chemical exposure to the most vulnerable parts of the lining beneath.

The revolutionary combination of a Koroseal® PCV liner and a LFP CrossFilm skirt™ delivers the longest lasting drop-in liner available on the global market for hard chrome plating applications. A technology which Lufthansa Technik believed was the right solution for its hard chrome plating tank.

Fast installation means minimum downtime

Drop-in lining systems are formed off-site to match the exact diameters of the application, taking into account any irregular shapes, outlets, outflows and flanges. Delivered in one piece, the flexible membrane lining has highly durable seams and corners which are dielectrically-welded through the entire 5mm material thickness, offering far superior chemical resistance compared to anti-corrosion screeds, which typically rely on much thinner seal coats. Weighing in at around 260kg, the handling, transportation and installation of the liner required careful management, an area of expertise in which NHE excels.

Lufthansa Technik already knew that the installation of this liner was going to be far faster than its previous experiences, with an initial timeframe of just three days. Once on site, NHE's highly skilled installation engineers completed the drop-in installation in just two days – a time and cost saving which surpassed expectations.

*'A' is deemed 'excellent', 1 is satisfactory up to 22°C (72°F) and 2 is satisfactory up to 48°C (120°F)

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Why NHE?

Through NHE's consultative approach to the specification and installation of corrosion-resistant linings, Lufthansa Technik can benefit from cost and operational efficiencies, improved chemical containment safety and ease of maintenance. All this with the added peace of mind that the lining is not bonded to the tank, which means that should the lining become damaged, it can be removed, repaired and reinstalled quickly and easily.

Each NHE installation is custom fabricated to meet precise application requirements, which means NHE's application portfolio is extensive – an appealing proposition to many niche facilities operating in highly-corrosive environments.

Peter Ayeni, Lean Manager, for Lufthansa Technik, commented on the new lining: "NHE was recommended to us by a number of other professionals from within our industry. Right from the off, the team showed an in depth understanding of our hard chrome plating operation and what we wanted to achieve from our new lining.

"The solution that they have provided not only outperforms our previous lining, but promises greatly improved life expectancy, simple maintenance and subsequent cost and time efficiencies."

Andy Shears, Technical Sales Manager for NHE, added: "This installation marks another successful project in our longstanding relationship with Lufthansa Technik, since we assisted with the installation of its plating tanks 16 years ago. We are confident that they will see significant monetary savings and benefit from less scheduled and unplanned downtime, which is exactly what this busy facility needs.

"The Koroseal® lining system from Witt Linings is a class-leading solution for this type of environment and we are pleased to hear that Lufthansa Technik is considering switching to this solution for its other four tanks."

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