

ElectroFin[®] heat transfer coatings

LUVATA





Protection when it matters

Luvata is the industry-leading provider of coils to the global HVAC&R industry. We also provide specialised coatings to give our products the longest possible life and keep them working efficiently.

In any operation, mechanical equipment represents a huge investment and accounts for a significant proportion of electricity costs.

In addition, galvanic corrosion, formicary corrosion and standard aluminium oxidation can all cause an unprotected heat exchanger to deteriorate more quickly. This has a considerable impact on performance and working life, costing companies billions of dollars, euros and yen from decreased performance and higher energy consumption.

The best way to protect valuable equipment from the threat of corrosion is to use a purpose-made coating.

Protecting more than vital equipment

At Luvata we are very aware of our environmental responsibility and we know that our customers are too. We are committed to using cleaner end products and cleaner operating processes. So, all our coil coatings are water-based, which makes them kinder to the environment.

"It is more important than ever to have a partner who not only understands the dynamics of your business but who also has the proven expertise, global resources and leading-edge technology to help you avoid this costly mistake."

That is why we've now expanded our coatings footprint to include four factories in the United States, one in Mexico and now, one in Italy, to meet European demand."

Dennis Appel
Executive Vice President
Heat Transfer Solutions Division, Luvata

ElectroFin E-coat - OEM factory-applied solution

ElectroFin E-coat is a factory-applied electro-deposition coating process that guarantees complete heat exchanger coverage. The coil is fully immersed in a bath, where it acts as a magnet, attracting the coating to every surface. All e-coating which is not deposited on the heat exchanger is collected and re-used, minimizing both wastage and the impact on the environment. The result is a thin, flexible, durable, corrosion-resistant coating, giving the very best in corrosion protection.

ElectroFin® heat transfer coatings
by **LUVATA**

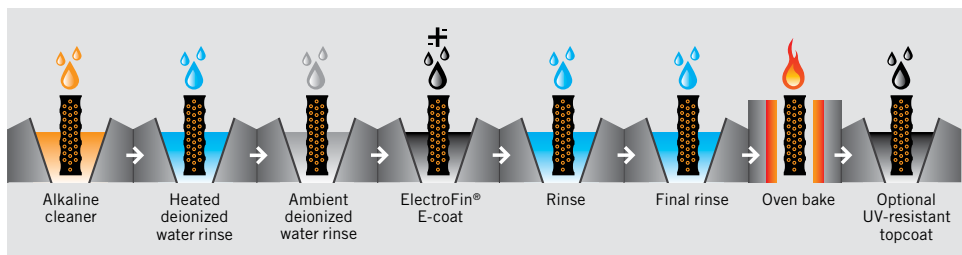


Heated alkaline cleaning process to remove contaminants



Factory-applied ElectroFin E-coat solution

ElectroFin E-coat was designed to provide corrosion resistant for both fin and tube, and micro-channel heat exchangers in coastal marine environments. It can cope with the harshest conditions and is recognized by the HVAC&R industry as the leading technology in corrosion-resistance coatings. It is proven to significantly extend the life of HVAC equipment and is the preferred choice for every major OEM. There is no better solution to ensure a full and uniform coating.



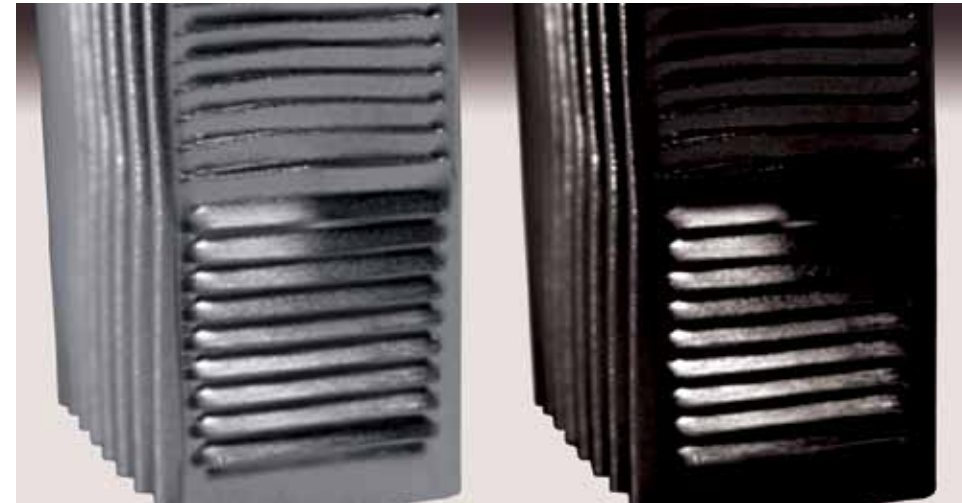
Factory-applied ElectroFin process



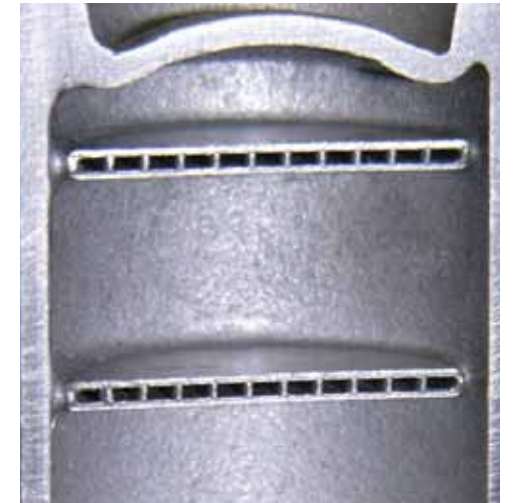
Factory-applied ElectroFin E-coat solution

Coatings for aluminium microchannel - Protecting the latest technology

In recent years, the air conditioning industry has been striving to improve energy efficiencies and reduce hydrocarbons. HVAC innovations include the all-aluminium micro-channel heat exchanger (MCHE), a technology used by the automotive industry for many decades. Benefits of MCHE include increased heat transfer and thermal performance as well as delivering lower coil weights. Further, MCHE can reduce refrigerant charge by up to 85% and lower noise levels as a result of reduced fan speeds. With technological advancement comes challenges and MCHE is no exception, particularly when selected for installation in corrosive conditions. ElectroFin E-coat meets that challenge head on to extend useful service life.



Aluminium micro-channel fins before and after ElectroFin E-coat



Manifold cross-section for micro-channel heat exchanger



Aluminium micro-channel tube

Micro-channel coil construction uses all aluminium alloys with brazed fin construction. Regardless of metal type, when exposed to an environment, all metals will react to their environment. The rate of reaction is dependent on temperature, humidity and pollution in combination with alloy (metal) selection. While MCHE's all aluminium construction is more resistant than traditional round tube plate fin heat exchangers, it is still not immune to galvanic corrosion, particularly when in the presence of chlorides or sulfides, which are typical in coastal and/or highly polluted areas. So, as with traditional heat exchangers, protection is needed.

Coating coils designed with enhanced fins or high fin densities, without bridging, is a challenging endeavor. The MCHE design proves even

more difficult to properly coat, particularly for traditional dip or spray coatings due to fin configuration and flux residues left behind from the manufacturer. As advancements in heat exchanger design brings us to smaller and more complicated surfaces, Luvata has kept pace with the challenges of the latest technology. Working with the leading MCHE producers, we have studied the dynamics of proper pre-treatment and electro-coating for all-aluminium heat exchangers.

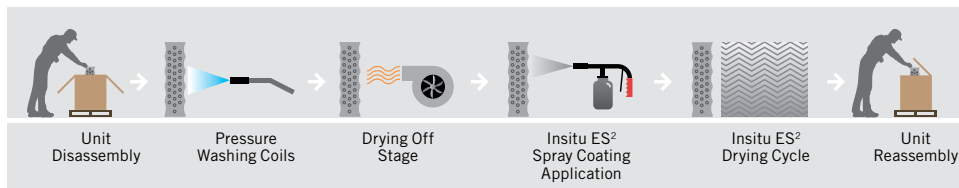
As a result, our purpose built ElectroFin E-coat with high edge build technology can be found on over a hundred thousand micro-channel condensers around the world, providing corrosion protection in some of the harshest environments known to man.

Insitu - After-market spray-applied solution

Electro-coating is not always a practical solution. A combination of time, distance and cost can mean that a field-based spray-applied coating is a more logical choice. Insitu® is a post-manufacturing coil and cabinet coating application designed with ES² (Embedded Stainless Steel pigments) technology to improve resistance to moisture, corrosion and UV degradation.



Insitu ES² spray-applied solution



Insitu application process



Insitu certified licensee training

We offer an Insitu certified licensee applicator training course to bring the Insitu process to customers in markets where Luvata does not yet have an established coatings presence. The course provides the same five day intensive training received by all Luvata-certified applicators. It takes place in our Spray Technology Center in Pompano Beach, Florida and includes extensive classroom and

The Insitu application process is performed by Luvata-certified technicians at any one of our spray hubs, or it can be applied on-site at your premises. Using spray-applied technology allows you to specify the protective coating you want for all unitary equipment and its internal components, in addition to the heat transfer coils. We believe Insitu coil and cabinet coating provides the best protection you can get without electro-coating.



hands-on training in the techniques of surface preparation, cleaning, mixing, spraying, product storage, quality control, safety and equipment maintenance.

It's all from Luvata, where our customers have relied on us for improved operational efficiency and innovative products for over one hundred years.

About Luvata

What does Luvata see for the future?

We have always aimed to improve our customers' products and processes, and to help them increase the efficiency of their businesses. But our vision is bigger than that. If human society is going to maintain the lifestyle that we all enjoy today AND offer it to emerging societies, we will all need to become much more efficient and to take much less from the planet. We are helping companies to make their products, processes and production more sustainable: do more, waste less, and pollute less.

What's Luvata's plan for getting there?

Luvata is increasingly bringing its expertise and dedication to high-growth regions and markets around the world. We are stepping into niche and specialist markets with our high-value, engineered solutions, and we are developing new solutions in partnership with our customers to conquer challenges at the front end of market demand.

How does Luvata behave?

In doing all this, we resolve to be the partner of choice for our customers, the employer of choice for our staff, and to be a positive and responsible friend to everyone else. We strive to be open-minded and focused on getting results; and when we promise, we deliver.

Where in the world are we?

Our global footprint stretches across America, Europe and Asia. Our diversity of locations, cultures and markets gives us access to a wealth of knowledge and expertise that simply keeps growing. It means that we are local to our customers, wherever in the world they are and can be responsive to their needs, including fast local delivery straight to the door.





About Luvata

Luvata is a world leader in metal solutions manufacturing and related engineering services. Luvata's solutions are used in industries such as renewable energy, power generation, automotive, medicine, air-conditioning, industrial refrigeration, and consumer products. The company's continued success is attributed to its longevity, technological excellence and strategy of building partnerships beyond metals. Employing over 6,500 staff in 17 countries, Luvata works in partnership with customers such as Siemens, Toyota, CERN, and DWD International.



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