LCE COATING
CHEMICAL PROPERTIES

Colour:	Translucent, with light gray pigment
Super Hydrophobic:	Additive to increase condensation and improve corrosion resistance
Gloss Level:	Full
Chemical Resistance:	Excellent (with the exception of strong alkalis or oxidising chemicals), see chemical resistance information here below
Solvent Resistance:	Dependent upon selection of solvent
Temperature Range:	-40°C up to 150°C
Fin pattern:	Standard and also suitable for enhanced fin designs
Fin Type:	Aluminium, Copper, Epoxy/gold, hydrophilic blue

TECHNICAL DATA:

Application method:	Total Coil Immersion
Immersion Cycle:	Dependent upon coil size
Curing Cycle:	Dependent upon coil size
Film thickness:	7-9 microns d.f.t. (dry film thickness) per coat
Heat Transfer:	Negligible impairment at the given thickness
VOC level:	85grams/Litre
Neutral Salt Spray on single sheet metal :	10.000hrs ASTM B117
Source:	Hawker de Havilland (Boeing)
Modified Salt Spray on single sheet metal:	3.000hrs ASTM G85
Source:	Jotun Malaysia
Complete heat exchanger (Al/Cu/galva steel) :	1.000hrs ASTM B117 (ISO 9227-NSS)
Source:	P-ZKL-66/15 - VZLÚ Prague, Czech Republic

C4 Corrosive category requirements as per ISO 12944 PASS

C4 High Urban and industrial atmospheres with moderate sulphur dioxide pollution and/or coastal areas with low salinity.

CHEMICAL RESISTANCE:

LCE COATING offers protection to a majority of aggressive environments with the exception of strong alkalis and oxidising chemicals.

The following is the chemicals and solvent resistance guide of chemical exposure:

Corrosive Agent	Strength	Rating
Hydrochloric Acid	5%	E
Hydrochloric Acid	10%	E
Hydrochloric Acid	20%	E
Hydrochloric Acid	30%	E
Sulphuric Acid	5%	E
Sulphuric Acid	10%	E
Sulphuric Acid	20%	E
Sulphuric Acid	30%	E
Phosphoric Acid	5%	E
Phosphoric Acid	10%	E
Phosphoric Acid	20%	E
Phosphoric Acid	30%	E
Phosphoric Acid	50%	E
Acetic Acid	10%	E
Sodium Hydroxide	10%	E
Ammonia in the air	30ppm	G
Urea in the air	30ppm	G
Trichloroethylene	30ppm	E
Toluene	25ppm	G
Methylated Spirits	30ppm	G
Mineral Turps	30ppm	G
MEK	25ppm	G
Acetone	25ppm	G
Hydrogen Sulphide	30ppm	G

Legend:
E = Excellent
G = Good

P = Poor
In addition the above LCE COATING demonstrates excellent resistance to fumes from the following: Lactic Acid, Oxalic Acid, Humic Acid, Saltwater and NOx.
Additional / Specific Resistivity

LCE coating product range is also resistant to the following materials.

Food acids :

1. Vinegar (3 – 7% Acetic acid), frequent cause of "copper tube pitting"
    - Found in many foods, such as Salad dressings
    - Present during Small goods curing
2. Lactic acid, also selectively attacking copper tube and can result in pitting.
    - Milk and Dairy products
    - Cheese products
3. Citric Acid, very widely used as food additive.
    - To acidify beverages
    - Confectionery
    - Effervescent salts, and other foods
4. Maleic acid, used in fact to reduce rancidity
5. Oleic acid, formed by hydrolysis of various fats and oils. On exposure to oxygen it forms rancidity in fats and oils.
6. Oxalic acids, found in many plants and vegetables. It is also the product of many moulds.
7. Alkyl sulphide, very corrosive vapours (onion nad garlic) to copper tubes.
    - Found in large amounts in onion processing plant and other food processing plants
8. Ammonia sulphate, aggressive attack Aluminium and Copper.

Vegetable and fruits :

Vegetables and fruits contain various acids which are mainly selective to copper (attack copper). They are the cause of significant coil copper damage via tube perforation. Acid concentration increases with multiply vegetable/fruit storage environments.

- Present in varying concentration during vegetable and fruit storage.

Environment / ambient :

1. **Hydrogen sulphide** (H_2S) and **Nitrous oxides** (car emissions)
    - Found in various concentrations near transport routes
    - Car parks
    - General industry

2. **CO_2** (carbonic acid), wide ambient presence. Also produced by burning coke and other carbonaceous materials.
    - Very widely experienced in industrial zones, power stations

3. **Salt spray / acidified salt spray**
    - Coastal and near coastal regions (main attack on coils is via Galvanic reactions leading to corrosion of aluminium and other anodic metals.
    - Shipping and transportation by sea

Alcohol beverages manufacture / processing

Ethanol vapours

- Vapour concentrates on evaporator coils
- Fumigating / sterilising chemical vapours

Wood processing

Humic acid selectively and rapidly attacks copper tube components of coils during timber drying/aging

Metal foundries

Hydrochloric acid vapours and other vaporised metallic compounds.

Coated Coil Maintenance

1. Coil exposure environment is of significant importance and contributes to the final long term outcomes. It is therefore important to understand the ambient 'contaminants' and how they need to be dealt with to minimise exposure.
2. Please ensure that routine coil maintenance program is well designed and maintained. Where the maintenance is based directly on the exposure environment and must be strictly adhered to. The visual inspection of the coil/coil surfaces plays and important component of the routine coil maintenance.

3. The coil cleaning regime is applied (and depends on the exposure environment) at frequent intervals from weekly bases. It involves light application of a neutral cleaner, with effective clean water rinse. This process is repeated as required and effective records need to be maintained.
4. Should the visual maintenance identify some starting imperfection in the surface of the coil, then immediately correct this imperfection and apply sufficient coating with a brush application.

Coil exposure environment:

1. Please ensure that you are aware of the coil exposure environment by monitoring the ambient ppm as well as applying laboratory grade pH paper to the coil surfaces. Which will establish the pH of the airborne components depositing on the coil surfaces.
2. Review your routine visual inspection as well as coil maintenance including cleaning regime.
3. Please ensure you clean coils with neutral cleaning solutions, followed up by effective clean water rinse. Perform this process at regular intervals.
4. In harsh coil exposure environments it is necessary to apply clean water spray onto the Air-On side of the coil at daily intervals. This minimises concentrating of airborne deposits on the coil surfaces.
5. Record visual as well as routine coil maintenance.