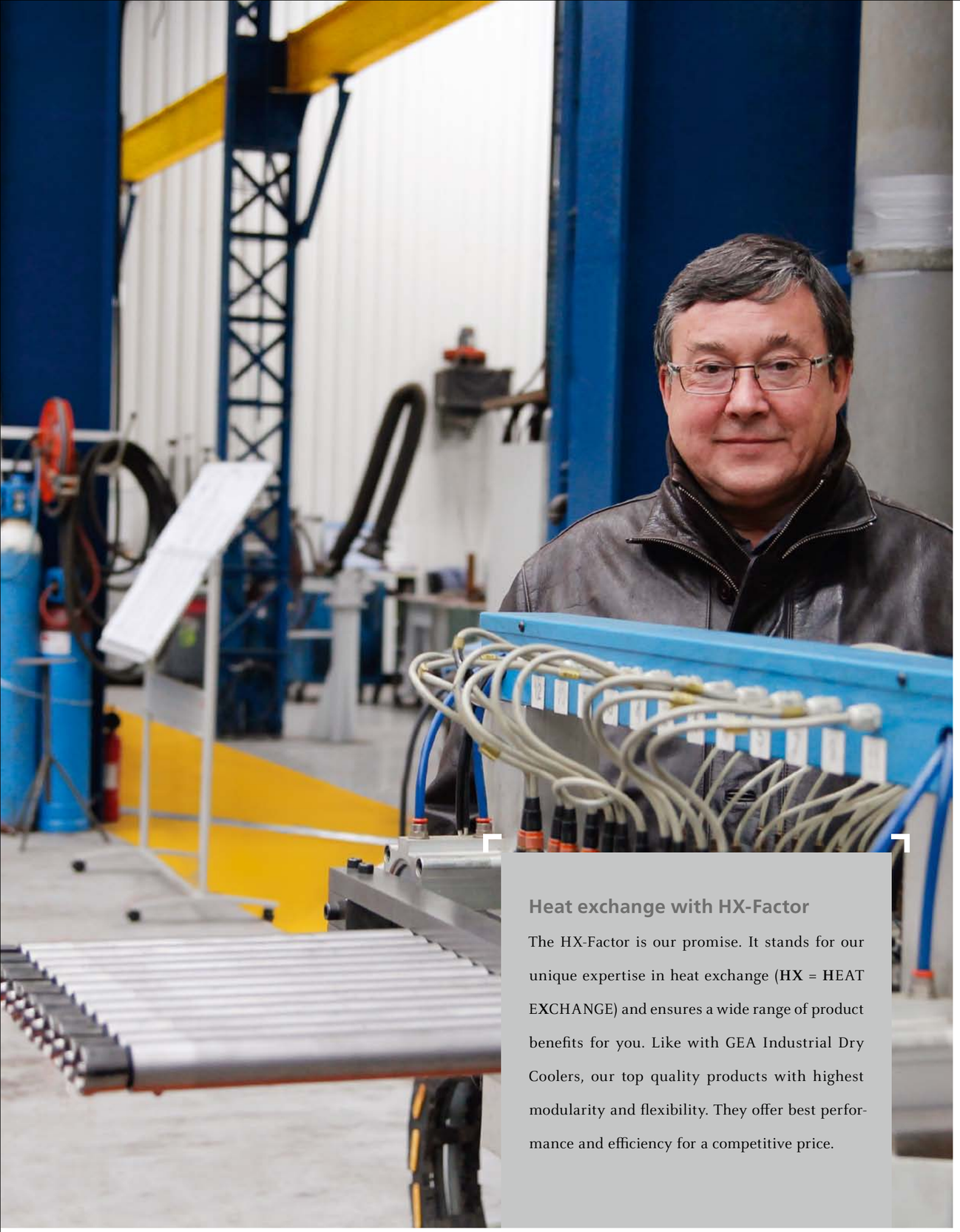


GEA Industrial Dry Coolers with HX-Factor

Highest configuration level
dedicated to industrial and power applications



Heat exchange with HX-Factor

The HX-Factor is our promise. It stands for our unique expertise in heat exchange (**HX** = **H**EAT E**X**CHANGE) and ensures a wide range of product benefits for you. Like with GEA Industrial Dry Coolers, our top quality products with highest modularity and flexibility. They offer best performance and efficiency for a competitive price.



The new standard in heat transfer

GEA Industrial Dry Coolers for industrial and power applications

Worldwide leading in heat exchange

As an internationally active technological group, GEA group concentrates on process technology and components for demanding production processes in a wide variety of end-user markets. GEA Heat Exchangers, the largest segment within GEA Group, consolidates all the activities in the area of heat exchangers and comes with probably the largest portfolio in this field worldwide. Heat exchange with HX-Factor: That means customized, reliable and sustainable solutions conforming to the signs of the times. GEA Industrial Dry Coolers prove this quality and innovative strength.

GEA Industrial Dry Coolers (IDC)

The range of high-quality configured GEA Industrial Dry Coolers was developed to match the technical requirements of the main players in the small- to medium-size diesel and gas-engine market (normally <2.5 MW) as well as a wide diversity of marine and industrial processes with average to low cooling capacities. Literally thousands of models, created with modular design and a variety of fan sizes, offer an extensive choice to match your exact requirements – with competitive prices and short delivery times. GEA has advanced the technology of the finned tubes for decades. Plants operate reliably and efficiently using GEA Industrial Dry Coolers, now equipped with ERP compliant fans for highest ambient temperatures. Modular compact products made of predefined components are assembled according to analysis made by design software. The compact products are completely assembled and tested in the GEA factories before delivery. All major configurations are available: flatbed (induced and forced draft), V-bank, double-bank, horizontal or vertical, for all individual cases. All components of the GEA IDC product range are standard, and outsourced items with long delivery times are kept in stock to ensure prompt delivery. Only a limited selection of outsourced components (fans, motors, etc.) is used, to ensure favorable prices from suppliers, based on large quantities of similar components. Product modularity ensures sizing as close as possible to the customer's requirements, with prompt availability owing to components manufactured in-house. A wide variety of dimensions and a large selection of accessories are available and allow a maximum of flexibility.

Compliance to codes and standards

Pressure vessel

- PED article 3.3

E-motors

- Low voltage
  European directive 2006/95/CE
- Electromagnetic compatibility
  European directive 2004/108/CE

Dry Coolers

Requirements of the machine directive and DNV for marine applications, including

- Grid type and position of fans
- Machines
  European directive 2006/42/CE

Fans

- ERP 2013 regulation available

ErP ready

Dimensions and configurations

Unit	Module length	Lines of fans	Fans per line	Total length	Fans Ø	Arrangement
IF_A	1,200 mm	1 & 2	1 to 11	1.2 to 13.2 m	762 mm 800 mm 900 mm 910 mm	Induced Forced Vertical
IF_B	1,500 mm	1 & 2	1 to 9	1.5 to 13.5 m		
IF_C	1,800 mm	1 & 2	1 to 7	1.8 to 12.6 m		
IF_D	2,100 mm	1 & 2	1 to 6	2.1 to 12.6 m		
IF_F	1,300 mm	1 & 2	1 to 10	1.3 to 13.0 m		

Optional solutions for smooth continous operation

GEA IDC product range

Accessories and equipment

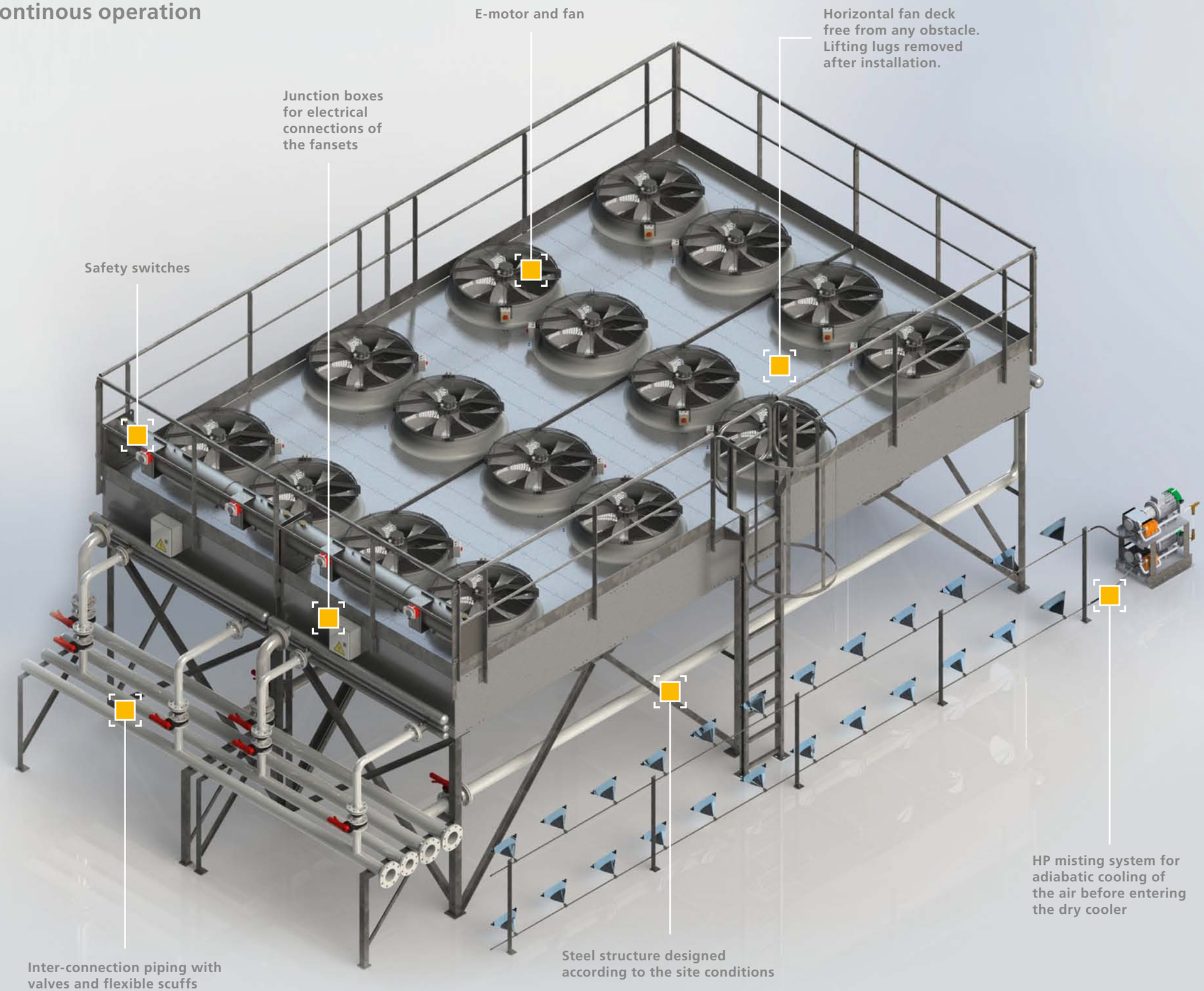
All necessary mechanical accessories are available from GEA for this application, such as ladders and handrails for fan access, steel structures, piping and valves, and expansion tanks. We can also provide all required electrical components for protection and control of the system, i.e. control cabinets for starting and stopping fans – either in stepped mode or by frequency inverters. Required instrumentation such as temperature probes and vibration switches can also be supplied, as well as any other specific instruments. Water spraying can be added to the dry cooling system to enhance cooling capacity for peak temperatures, to effectively avoid oversizing the complete system for only brief operation at high temperatures. Fins coating is one of the main competitive advantages of GEA Industrial Dry Coolers. We use the highly customized paint PoluAl, which our partner Blygold developed for this application. Without loss of thermal efficiency, it provides highly effective protection against corrosion risks in salty air and at industrial sites. Other conventional coatings such as epoxy are also available, but they provide much lower protection, with shorter lifetime of the coolers.

Benefits from a high level of configuration

- Up to 22 fans per unit for large duties
- Twin circuits (High temperature and low temperature in series on air side)
- New high temp fan types ERP compliant from newly incorporated fan suppliers
- Forced draft for very high temp design
- High resistance coating for the fins (AlMg + Polual) and casing (Z275 + C5M)
- Adiabatic cooling with high pressure adiabatic spraying system
- New casing design with reduced number of pieces and similar design for induced or forced draft units. Assembly by means of rivets and blind rivets or bolting in SST

Reduced effort and easy installation

The electrical connections between the junction boxes and the motors are made by GEA. This plug & play solution reduces work at site and allows an easy and quick installation. Besides, armoured cables will be used for VFD control of the fans.



Technology and functionalities

Main components and optional items



Main components and standard configuration

- Induced and forced draft, V-bank, vertical
- EC control on fan sets
- Improved sidewall design:
  - The dry cooler design takes into account several units installed side by side on a steel structure.
  - The steel casing side walls are suitable for the adaptation of hand rails.
  - The side wall height is suitable for fitting the fans and for appropriate air distance between fans and bundle in case of forced draft coolers.

Optional equipment

- Steel structure
- Handrails and ladders
- Piping and accessories
- Water spraying system (HP with patent or LP) – see GEA Adiabatic Dry Coolers brochure
- External VFD control
- PTC probes on motors
- Junction boxes, cables and MCC
- Safety switches on fans
- Expansion tank with level detector

Seaworthy packing

- SEI3B and SEI4B
- Standard containers (dry and OT types)

Steel structures

- Made of HDG angle beams
- Made of folded steel sheets up to 1.2 m higher (than HDG angle beams)
- Mechanical calculation report available on request

Fans access and repair

- Horizontal fan decks free of any obstacles
  - Lifting and handling of fansets can be made manually
  - Cables located inside the ventilation chamber
- Ladders and peripheral handrail
  - Modular systems made of HDG angle beams
  - Assembled by bolting only

Fansets – technical characteristics

- Normal AC fanset
- Quiet AC fanset
- High-temperature AC fanset
- EC fanset technology
- Atex fansets
- Cables H07RNF – UV resistant

Heat exchanger – based on S32, S40 & 5S technologies from GEA with:

- Fins: Alu, AlMg or Copper – flat, rippled or turbulated
- Fins thickness from 0.135 to 0.20 mm
- Fins pitch from 1.8 mm to 4.0 mm – tubes to fins bonding made by mechanical expansion
- Copper headers brazed to the tubes
- S32: Triangular tube pattern – staggered layout
  - Copper tubes – Ø12 mm thickness from 0.35 to 1.0 mm
- S40: Triangular tube pattern – staggered layout
  - Copper, steel and stainless steel tubes Ø16.0 mm thickness 0.40 mm, flat and turbulated fins
- 5S: Triangular tube pattern – staggered layout
  - Copper, steel and stainless steel tubes Ø15.65 mm thickness 0.45 mm, flat and rippled fins

Guaranteed safety

Surface treatment and quality tests

With more than 80 years of experience in the design and construction of heat exchangers, GEA has developed countless types of compact fin tube systems to meet all specific requirements involving media temperature, pressure, noise levels, reduced footprint, vibration, and protective coatings. In partnership with Blygold, GEA has developed a unique automated process to apply a perfectly graduated coating. It protects the compact finned coils against harsh environmental conditions such as erosion by sand or salt. It provides a barrier and avoids the risk of electrolytic reactions between the two metals involved. The coating contains aluminum to maintain the thermal performance of the compact coil, resulting in extension of the lifetime, maximum cooling capacity, and reduction of energy costs. In the event of any incident or shock to the exchange surface, the fins and the film can be repaired on site without changing or even moving the radiator.

GEA advanced ring fin features

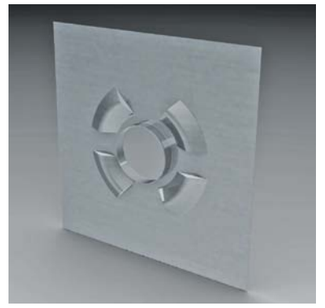
- Market's best ratio efficiency/pressure drop
- Very low sensitivity to clogging risks
- High-tech ring guides the cold air behind the tube
- No obstacle to generate turbulences (louvered fins)
- Technology fully suitable for all industrial environments
- Extensively and successfully applied for more than 30 years in our heat exchangers all over the world

Surface treatment for normal conditions

- Casing and fan rings: Z275
- Structural steel and access: HDG to ISO 1461
- Motors: 50 µm std supplier
- Headers: Alu HT paint
- Fins: N.A.

Surface treatment for corrosive, chemical and mechanical resistance

- Casing and fan rings: Z275 + coating (Sorabond-C4, C5 or C5M)
- Structural steel and access: HDG to ISO 1461
- Motors: C3 150 µm thick or C5M 300 µm
- Headers: Alu HT paint
- Fins: depending on site conditions (see diagram No. 2)



Patented ring shape



Fin coating

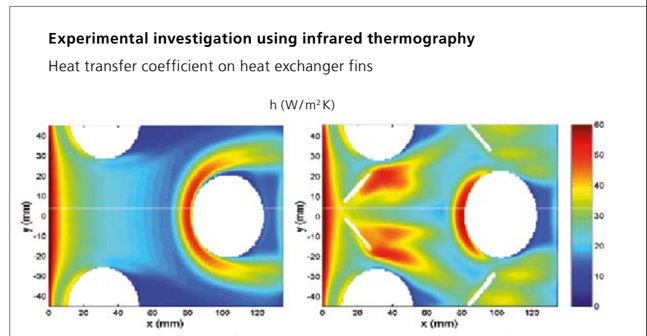


Diagram No. 1: IR thermography

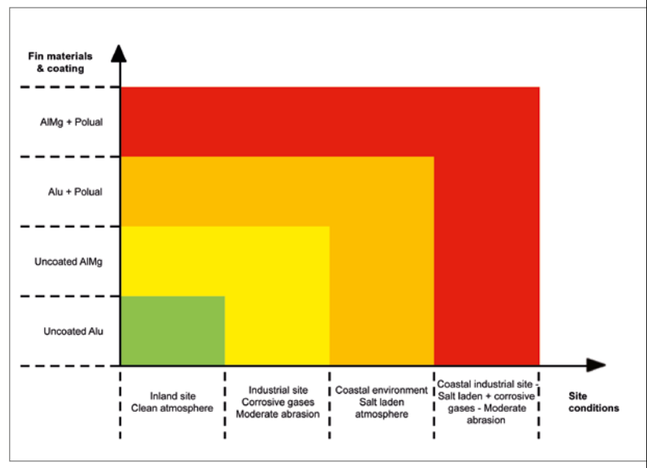


Diagram No. 2: Fin technologies vs site conditions

Standard tests, documentation and reports

- Leakage test
- Vibration tests
- Electrical tests
- Noise measurement on request
- Technical data sheets & MOMs

We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 Index.

GEA Heat Exchangers

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