

POWER GENERATION AND PROCESS COOLING



RADIATORS & DRY COOLERS



Power Generation and Process Cooling

POWER:

Engine cooling (gas, biogas, diesel, HFO..)
Cogeneration / ORC / Waste to Energy Power plants
HVDC (High Voltage Direct Current)
TAIC cooling (Turbine Air Inlet Cooling)
Geothermal plants
Solar thermodynamic plants

PROCESS:

Chemical and pharmaceutical industries
Air / Gas compressor cooling stations
Industrial processes cooling (steel / plastic / glass / cement plants)
Automotive industry
Data centres

OIL&GAS:

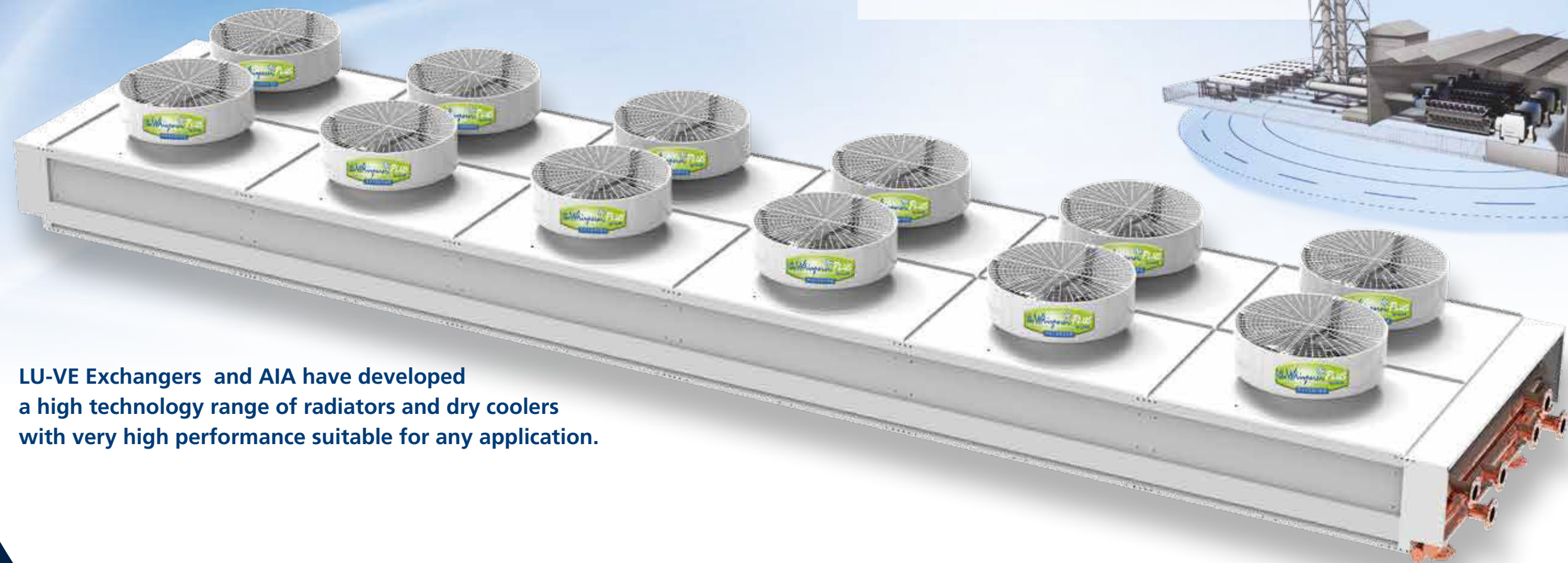
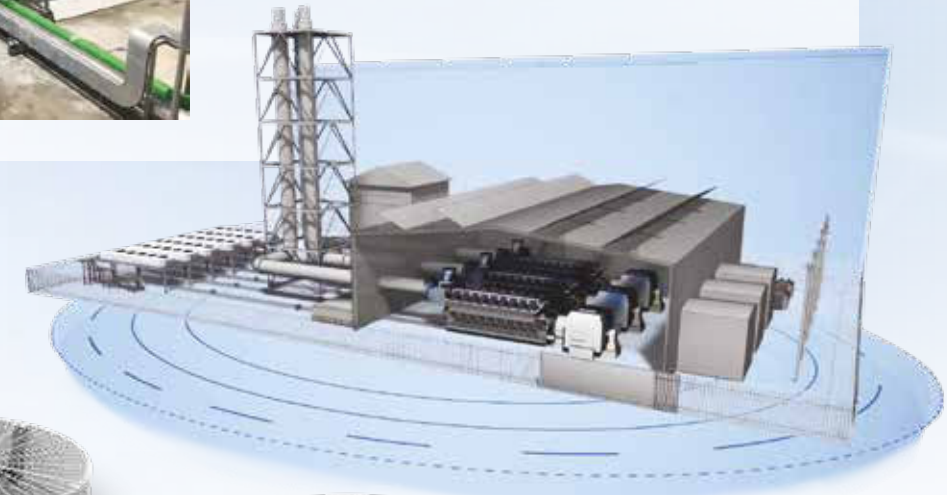
Oil and gas industry



WIDE VARIETY AND COMPACT SOLUTIONS



In big installations, a great number of radiators are required to dissipate the large amount of heat produced. The high efficiency and the wide variety of LU-VE Exchangers and AIA product solutions make it easy to choose the best way to reduce the number of units and therefore the investment and operating costs.



LU-VE Exchangers and AIA have developed a high technology range of radiators and dry coolers with very high performance suitable for any application.

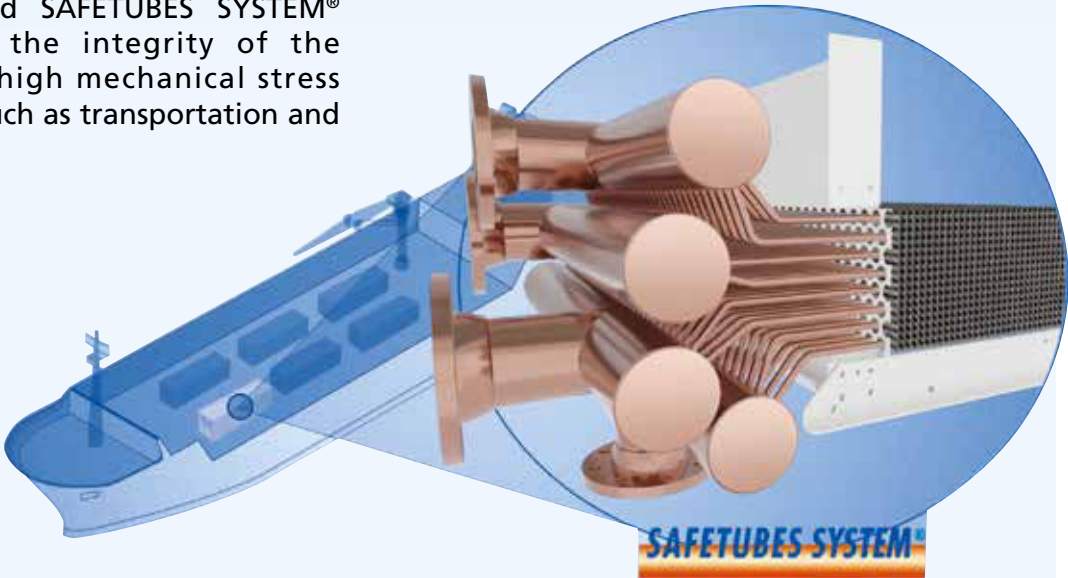
LOW DIRT ACCUMULATION & SELF-CLEANING SYSTEM

High and low-temperature circuits use the same coil, reducing the accumulation of dirt compared to traditional radiators with separated overlapped coils. The direction of rotation of the EC motors can be reversed in order to clean the coil making maintenance fast, cheap and easy.



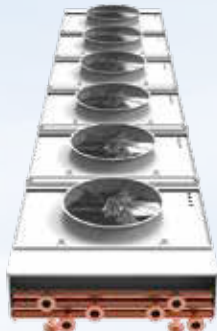


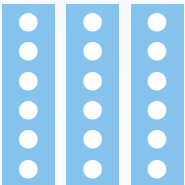
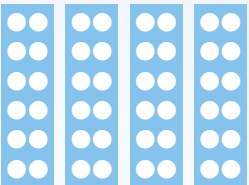
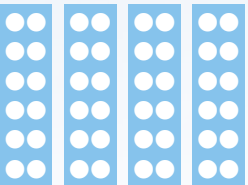
MACHINE RESISTANCE TO STRESS

The patented SAFETUBES SYSTEM® guarantees the integrity of the coil during high mechanical stress operations such as transportation and installation.



VERY LOW ENERGY CONSUMPTION AND SILENT OPERATION

At equal capacity LU-VE can propose different solutions with different benefits. Best results can be obtained by using electronic motors in conjunction with the Whisperer Plus® silencers.

| Comparison between different LU-VE solutions to cool a 10 MWe engine sample: | | | |
|--|---|---|---|
| RADIATOR TYPE | BASE  Ø1250 MODEL AC FANS | HIGH EFFICIENCY  Ø910 MODEL EC FANS | VERY HIGH EFFICIENCY  Ø910 MODEL EC FANS + WHISPERER PLUS® |
| Number of radiators |  |  |  |
| Δ Investment cost | Ref. value | +4% | +18% |
| Δ Total Power consumption | Ref. value | -38% | -50% |
| Δ Total sound level | Ref. value | -9 dB(A) | -14 dB(A) |
| Δ Total footprint | -25% | Ref. value | Ref. value |
| Δ investment pay back time | Ref. value | approx 900 working hours | approx 3000 working hours |

Note: 1) Electricity cost 0.1/kWh - 2) Costant thermal load for all the year - 3) Ambient temperature 45°C with same working conditions

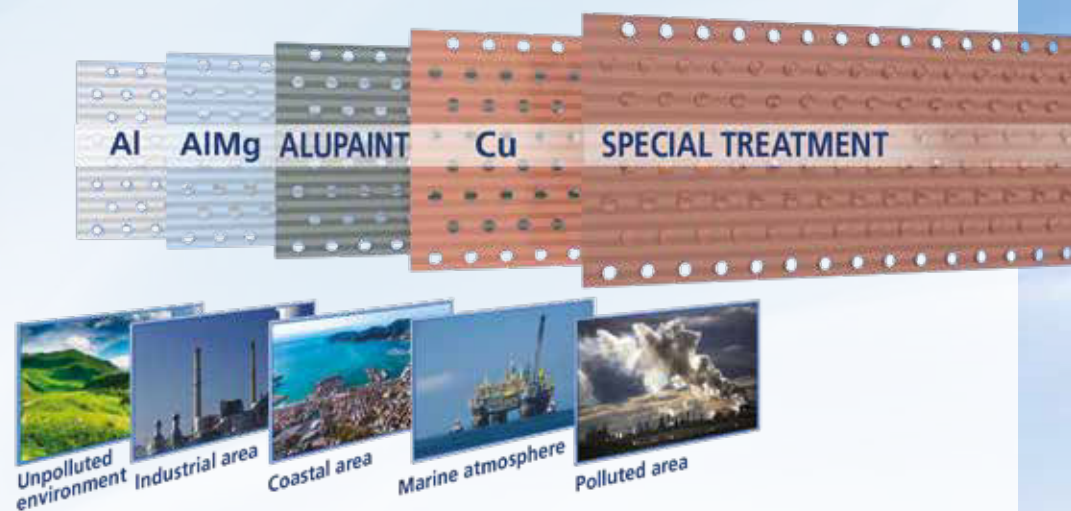
TRANSPORTATION COST REDUCTION

The high thermal efficiency and therefore the reduced footprint make it possible to ship two units in the same container, virtually halving transport costs.



PROTECTION FOR ALL ENVIRONMENTAL CONDITIONS

There are several alternatives to protect heat exchangers from corrosion, each of them designed for a specific environmental condition. In addition to thicker fins, there are solutions in aluminium-manganese alloy or copper fins and many surface treatments for the most severe conditions.



DIFFERENT MATERIALS (AVAILABLE ON REQUEST)

| | STANDARD CONFIGURATIONS | SPECIAL CONFIGURATIONS |
|---|---|--|
| Tubes | Cu DHP | CuNi 90-10, CuSn, SS AISI 304L, SS AISI 316L |
| Fins | Al – alloy 8006 | Alupaint(*), Cu DHP, CuSn, heat exchanger painted after construction (Blygold, Heresite,...) |
| Headers | Cu DHP | Fe (ASTM A106 gr B), SS AISI 304L, SS AISI 316 |
| Casing | Galvanized steel, powder-coated, RAL 9003 (C4 corrosion resistance) | SS AISI 304L, SS AISI 316L |
| (*)Alupaint: pre-polyester-painted aluminium strip capable of withstanding 1000 hours in salt spray test (ASTM B117). | | |

Axial fans are fitted, lubricated for life and balanced both statically and dynamically.
Balance grade G6.3 (to ISO 1940 part 1).
The protective fan grilles conform to the EN 294 Standard.

FAN DIAMETERS 800 - 910 - 1000 [mm]

Fan-motors with external aluminum or composite material rotors. In this configuration the fan-motor is a single item and has several advantages:

- compactness
- excellent aerolic and electrical efficiency
- lightness
- easy replacement

AC fan motors can be regulated with cut-phase controller or inverter. To achieve the highest energy efficiency, EC fans are recommended.
Using more compact fans rather than few big-diameter fans enhances the reliability of the radiator, limiting loss of performance in the event of one motor failing.
Surface treatments are available on request for these fan motors for severe environmental conditions.



FAN DIAMETERS 1250 [mm] OR MORE

Fan-motors with traditional internal rotors, directly coupled to the fan, generally constructed in PPG, PAG, Al.
These motors can be supplied with different grades of mechanical and electrical protection to match every condition. For these motors, speed regulation can be obtained with inverter.
In this configuration, the fan and motor can be adapted to the specific needs of the plant, maximizing heat capacity and reducing the footprint.

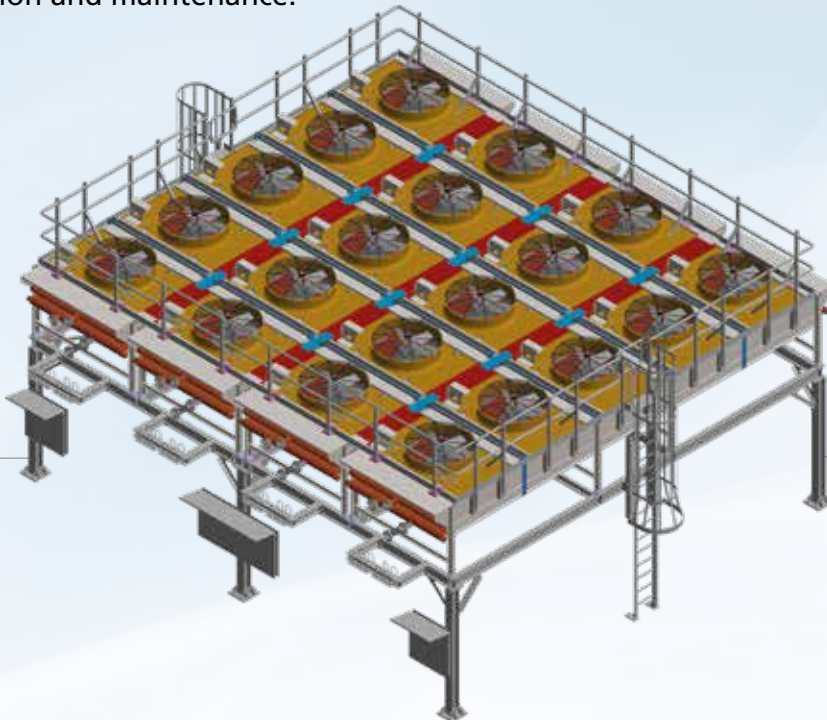


Accessories

There are different accessories available for all the types of radiators and dry coolers to facilitate installation and maintenance:

1

Platforms and frames ladders and handrails



2

Special connection headers

between the multiple connections of the exchangers and drainage header to guarantee complete drainage of the heat exchanger



3

Inspection panels and hinged fan shrouds

to facilitate maintenance and cleaning of the heat exchanger



Control and regulation systems

These products can be supplied with customized electrical panel both for electrical connections and fan speed control to match every need.

A complete range of regulation systems can be installed in order to better control operating conditions and maximize energy efficiency:

- Inverters
- Cut-phase controllers
- EC fan controllers
- STEP controller



An example of electrical panels

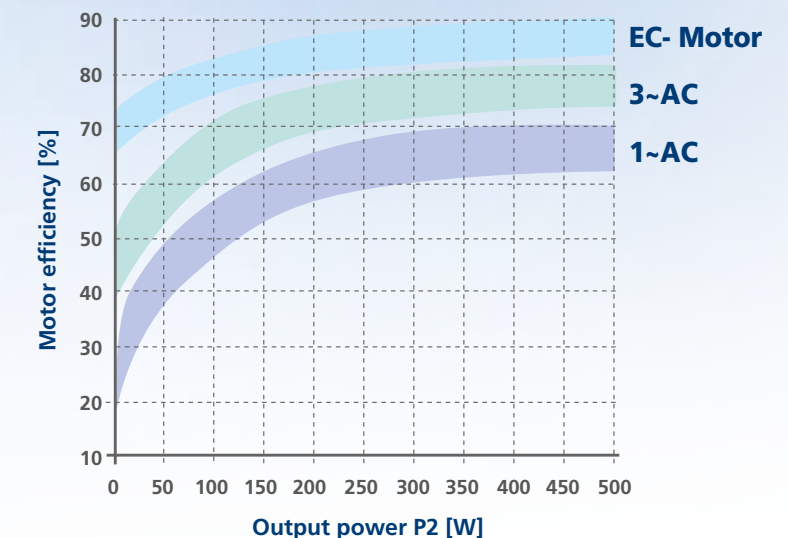
BENEFIT OF EC FANS

LU-VE Group proposes EC brushless fan technology. This guarantees even greater energy savings, thanks to the superior efficiency of the motor.

MAIN ADVANTAGES

- Reduced power consumption
- Noise reduction in comparison to traditional fan speed controls
- Self-protected motor
- Integrated speed control

ENERGY EFFICIENCY



Contact us: powergen@luvegroup.com

THE WHISPERER PLUS® SILENCER

This advanced and compact silencer, designed and tested in the LU-VE Group R&D laboratories, dramatically reduces sound pressure level up to -6 dB(A). This result has been guaranteed by independent tests carried out by TÜV SÜD of Munich (Germany). Condensers and dry coolers equipped with "THE WHISPERER® PLUS" have the following benefits:

- Energy savings
- Reduction of sound pressure level at equal capacity
- Increase of capacity at equal sound pressure level
- Smaller unit footprint at equal capacity and sound pressure level
- Elimination of warm air recirculation.





The oil and gas industry requires highly reliable products, involving thermodynamic and mechanical design aspects and also great attention to safety. LU-VE Group can completely comply with all the criteria, thanks also to the ASME Certification Mark with "U" designator of official approval on its machines. One more aspect of great relevance is the use of tubes with reduced diameter (normally $\frac{3}{8}$ " or $\frac{1}{2}$ ") which drastically reduces the internal volume and the quantity of refrigerant.



For applications in explosion risk environments, LU-VE Group has a specific range equipped with fans which comply with the ATEX Directive 2014/34/UE for zones 1 and 2. To guarantee its complete adherence to the official regulations, the machine displays the EX mark. Therefore all the sheet metal parts are treated with a special paint which conducts current, guaranteeing the absolute equipotential of all the surfaces: as an alternative, the machines can also be supplied with stainless steel casings.



STANDARDS & REGULATIONS

The heat exchangers are designed and assembled in compliance with the following European Union standards and regulations:

- Machinery Directive 2006/42/CE
- Pressure Equipment Directive (PED) 2014/68/UE
- Electromagnetic Compatibility Directive (EMC) 2014/30/UE
- Low Voltage Directive (LVD) 2014/35/UE

It is also possible on request to have machines sized according to the standard ASME VIII div. I, approved by ASME U stamp.

PERFORMANCE

The full range of condensers and dry coolers are Eurovent certified. This means capacity, noise and energy efficiency specified in the commercial catalogues and selection software are guaranteed.

The tests standards applied to the machines are:

ENV 327 for heat exchange capacity of air-cooled condensers

ENV 1048 for heat exchange capacity of dry coolers

EN 13487 for the measurement of sound power level of condensers and dry coolers.

To ensure that the indicated performance levels are achieved, the products must be correctly installed in line with the general standards of best technical practice and following the instructions in the company manuals for use and maintenance.



LEADERSHIP WITH PASSION

LEADERSHIP IN ACTION



LU-VE Group is an international enterprise with its headquarters in Uboldo, Varese, Italy, along with its main offices and principle production facility. The strength of the Group lies in its 11 production plants located in 7 different countries: Italy, China, Czech Republic, India, Poland, Russia, and Sweden. The companies which make up the Group are:



AIA/LU-VE Sweden (Asarum, Sweden):

heat exchangers for refrigeration, air conditioning and industrial applications;



HTS Heat Transfer Systems (Novosedly, Czech Republic):

coils for air conditioning, refrigeration and for special applications (trains and means of transport in particular);



LU-VE Digital (Uboldo, VA, Italy):

information technology, development and implementation of calculation software;



LU-VE Exchangers (Uboldo, VA, Italy):

heat exchangers for refrigeration, air conditioning and industrial applications;



LU-VE Heat Exchangers (Changshu, China):

heat exchangers for refrigeration and air conditioning, destined for the Chinese and Asian markets;



SEST (Limana, BL, Italy), SEST LU-VE Polska (Gliwice, Poland), "OOO" SEST LU-VE (Lipetsk, Russia) & SEST LU-VE China (Changshu, China):

heat exchangers and condensers for refrigerated cabinets and finned heat exchanger coils for commercial refrigeration and air conditioning;



SPIROTECH Heat Exchangers (Bhiwadi, Rajasthan, India):

heat exchangers for domestic appliances, air conditioning and refrigeration;



TECNAIR LV (Uboldo, VA, Italy):

close control air conditioning for applications in surgical rooms, white rooms, data centres and telephone exchanges;



TGD - Thermo Glass Door (Travacò Siccomario, PV, Italy):

glass doors and closing systems for professional, domestic and industrial refrigeration equipment.



LU-VE S.p.A. is the holding company of LU-VE Group. In 1985 LU-VE S.p.A. acquired Contardo S.p.A., established in 1928. Production began in 1986.

LU-VE quickly made its mark thanks to high standards of quality, new solutions designed in its own laboratories and to the care taken with the appearance of its products. (Beautiful outside - Revolutionary inside).

It was the first company in the world to apply avant-garde solutions to commercial and industrial refrigeration:

- grooved tube technology;
- specialized heat exchange surfaces;
- certified performance levels;
- innovative materials and colours;
- advanced design.

The success of LU-VE in the international market stems from its research and development policy, its great respect for the environment and its rigorous ethical and commercial principles.

In 2000, LU-VE was the first company in Europe to attain the prestigious Eurovent "Certify-All" certification for the entire range of its products: unit coolers, condensers and dry coolers.

LU-VE and the Group have introduced new ways of conceiving and constructing products for refrigeration, air conditioning and industrial applications, creating new technologies which have then gone on to become the benchmark for the entire industry.



LU-VE Sweden AB - Asarum, Sweden

AIA (Asarum Industriaktiebolag), established in 1960, has over half a century of experience in the heat exchanger business and is today one of the leading companies in the industry in the Scandinavian market. The company is noted in particular for the excellent quality of its products, which are designed on the principles of high efficiency and energy savings. The defining characteristics of the company are competence, flexibility, reliability and customer care.

AIA became part of the LU-VE Group in 2012. It has a modern production facility (total area 37,000 sqm, 12,000 sqm covered) and a research and development laboratory in Asarum, in the south of Sweden. AIA produces heat exchangers for industrial and commercial refrigeration, air conditioning and industrial applications, using advanced control systems, high-efficiency motors and water spray features.



Didn't you find what you were looking for in this brochure?

A wide variety of solutions is available to satisfy every requirement in all types of plants.



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