

Naturally,
LU-VE makes it better





Naturally

LU-VE makes it better



We've grown by a factor of 60 over the last 36 years.

There is a reason. Indeed, there are many:

RELIABILITY

INNOVATION CAPACITY

VALUE

CLOSE TO CUSTOMERS

AFTER-SALES SERVICES

SUSTAINABILITY

over 20 years of performance certification

has continued over time since 1986

design based on Life Cycle Cost and Life Cycle Assessment principles

20 manufacturing facilities in 9 countries

speed, punctuality and precision

since 1986 we've been attentive to people and the environment

1986 - 2022

MILLION €

600



ACQUISITION



GREENFIELD

300

250

200

150

100

50

0

LU-VE
1986

TECNAIR
1994

SEST ITA
1991

SEST LU-VE POLSKA
2002

METALLUVE
2004

SEST LU-VE RUSSIA
2007

LU-VE CHANGSHU
2011

AIA
2011

TGD
2014

SPIROTECH
2016

ZYKLUS
2018

AL Air
2019

REFRION
2022

1986

2022

* LU-VE was founded in October 1985
METALLUVE was later absorbed into LU-VE
LU-VE Changshu was substituted by LU-VE Tianmen
Tecnaair was sold in 2022



VENTILATED PRODUCTS



GLASS DOORS



www.luvegroup.com

COILS



LU-VE DIGITAL



DIGITAL SIGNAGE



www.components.luvegroup.com

MANUFACTURING FACILITIES

AIA

Asarum
Sweden

Air Hex

Alonte (Vicenza)
Italy

HTS

Novosedly
Czech Republic

Fincoil LU-VE Oy

Vantaa
Finland

LU-VE

Uboldo (Varese)
Italy

LU-VE DIGITAL

Uboldo (Varese)
Italy

LU-VE Tianmen

Tianmen (Hubei)
P.R.China

REFRION

Fluminiano di Talmassons (Udine)
Villa Santina (Udine)
Italy

SEST

Limana (Belluno)
Mel (Belluno)
Italy

SEST LU-VE Polska

Gliwice
Poland

000 SEST LU-VE

Lipetsk
Russia

SPIROTECH

Bhiwadi (Rajasthan)
Sarole (Maharashtra)
India

TGD

Travacò Siccomario (Pavia)
Italy

Zyklus Heat Transfer, Inc.

Jacksonville (Texas)
USA



Naturally

worldwide

LU-VE Group is one of the major manufacturers in the world in the heat exchanger field.

The Group (HQ in Uboldo, Varese, Italy) consists of **20 manufacturing facilities** in **9 countries**: Italy, China, Czech Republic, India, Poland, Russia, Sweden, Finland and USA with a network of more than **30 sales offices** in Europe, Asia, the Middle East and USA.



4,500 skilled employees



1,080,000 m² total surface area



300,000 m² covered area



Over **3,605 m²** of R&D Laboratories



More than **83%** of production exported to 100 countries



Turnover **€ 605 million** (2022)



Listed on the **Euronext STAR Milan**





Naturally

everywhere

You can find LU-VE Group products everywhere in your everyday life: in the beer dispensers in your local pub, in the refrigerated counters in the supermarkets where you do your shopping, in the fridges of the ice cream parlour downtown, and in the wine cabinets and coolers of your favourite restaurant.

LU-VE products are everywhere, cooling, storing, controlling and protecting:

- **Ventilated heat exchangers** for HVAC&R
- **Cooling systems** for power generation and industrial applications
- **Heat exchangers** for display cabinets and refrigeration machines
- **Heat exchangers** for mobile applications
- **Data center air conditioning**
- **Glass doors** for display cabinets



Naturally

inquisitive

LU-VE Group has one of the biggest Research and Development laboratories in its sector in Europe and has collaborated closely for many years with **Politecnico di Milano** and **29 other universities and research centers** in 13 different countries.

The **LU-VE Group laboratories** are equipped with:

C.F.D. (Computational Fluid Dynamics) software;

5 calorimetric rooms;

1 climatic test chamber dedicated to adiabatic systems;

2 wind tunnels to study the performance of fins with specialized surfaces;

Tube performance testing equipment, for the study and optimization of grooved-tube technology;

2 aerodynamic tunnels for fan tests;

2 CO₂ test plants for gas coolers and unit coolers,

2 Sound level test room;

Test plant for condensers, dry coolers and adiabatic systems;

Test plant for heat exchanger corrosion and fouling;

R&D area for the study of controllers and electronics.

Innovation is in our DNA

Helios
4 mm tube technology

Igea
Mirabilia

R-Fin
Image
Magic Vision

Armonia
Gateway

Nidea
Emeritus

Zero Energy Glass
The Whisperer plus

Plug&Save

Minichannel

Lt 0 Energy door

The Whisperer

BLS Titan door
LAS door

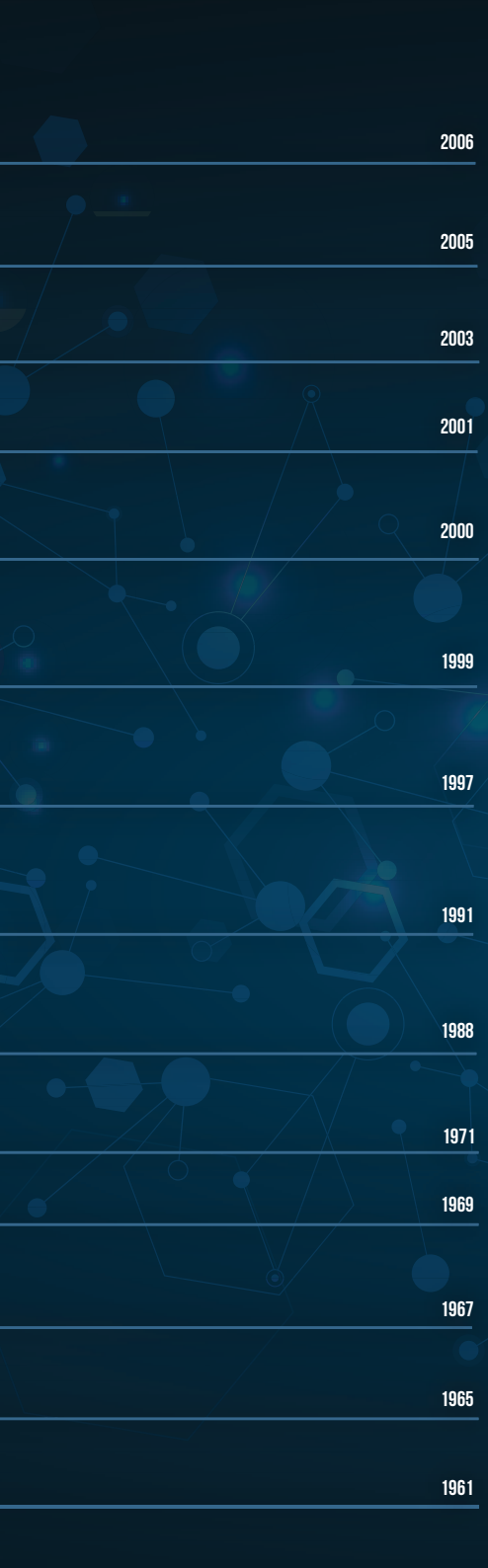
BLS door
Jetstreamer

2022
2021
2019
2018
2016
2015
2014
2012
2011
2010
2009
2008

Naturally



creative

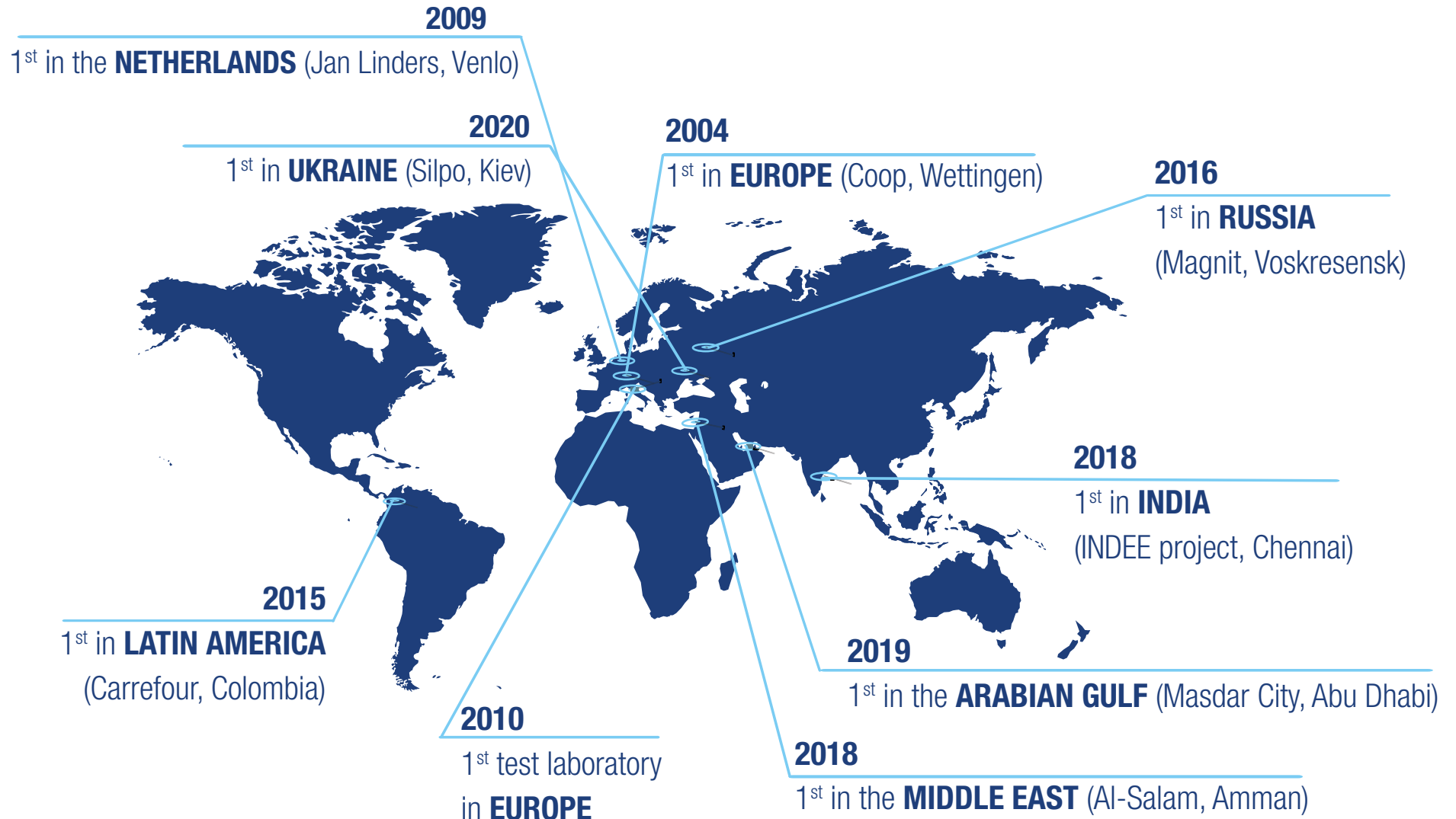
- 
- 2006 **Dry and spray Smart system**
 - 2005 **Oval Tube**
 - 2003 **Wet and dry**
 - 2001 **Jet-o-matic**
 - 2000 **Water spray system**
 - 1999 **Safetubes System**
 - 1997 **Superhitec unit coolers**
 - 1991 **Hitec condensers**
 - 1988 **Hitec unit coolers with Turbocoil**
 - 1971 **STF**
 - 1969 **Alupaint**
 - 1967 **Internal and external turbo-system**
 - 1965 **Dual fin spacing**
 - 1961 **Electric defrosting**



Naturally

the first

in transcritical CO₂ installations





Naturally

transparent

In 2000, LU-VE was the first company in Europe to achieve the then new, important, **“Eurovent Certify All”** certification for the entire ranges of condensers, dry coolers and industrial unit coolers.

In 2016, Eurovent certified that the LU-VE heat exchangers for refrigeration had never registered a single negative test in the course of three different test cycles (from 2011 to 2015), for a MFV (Mean Failure Value: average value of tests with negative outcome) **equal to zero**.

In 2020, among the very first companies to obtain Eurovent Certification for **CO₂ unit coolers**.

In 2022, among the very first companies to obtain Eurovent Certification for **CO₂ gas coolers**.



- ✓ CAPACITY
- ✓ SOUND PRESSURE LEVEL
- ✓ ENERGY CONSUMPTION
- ✓ AIR FLOW RATE

“Certify All” certification of Eurovent



Naturally

LU-VE makes it better



MAXIMIZED PERFORMANCE
AND EFFICIENCY



ENERGY SAVING



MINIMIZED REFRIGERANT
CHARGE



REDUCED
NOISE LEVEL



MANAGE AND
CONTROL



CO₂ EQUATOR
REDRAWING



MINIMIZED WATER
CONSUMPTION



CUSTOMIZATION



REDUCED FOOTPRINT
AND WEIGHT



CORROSION
RESISTANCE



REDUCED
MAINTENANCE AND
OPERATING COSTS



MAXIMIZED
RELIABILITY



TRANSPORTATION, TRAIN AND MOBILE AIR CONDITIONING AND REFRIGERATION



AIR CONDITIONING FOR DATA CENTERS

Naturally



REFRIGERATION FOR COUNTERS AND DISPLAY CABINETS AND AIR CONDITIONING



GLASS DOORS, CLOSING SYSTEMS AND DIGITAL SIGNAGE SOLUTIONS



REFRIGERATION AND CONSERVATION OF FRESH AND PACKAGED FOOD AND FLOWERS



AIR CONDITIONING, HEAT PUMPS AND HOUSEHOLD APPLIANCES

a wide range of products



POWER GENERATION, NUCLEAR, OIL & GAS, STEEL-MAKING AND MINING



FRESH FOOD CONSERVATION AND PERISHABLE FOOD BLAST FREEZING

Ventilated heat exchangers



A collaboration between LU-VE Group and Laboratory of Energy Conversion and Storage (LabX) - Politecnico di Milano.

"**Helios**" is a CO₂ gas cooler equipped with **photovoltaic panels** integrated into the structure, electrical inverters, and an electrical energy storage system.



- **CO₂** as sustainable refrigerant
- **EC fans** for speed optimization
- **Photovoltaic panels** with energy storage system
- **IoT platform** for data and analysis

Up to **50% of energy saving**





COMPACT COMMERCIAL UNIT COOLERS



The commercial unit coolers are designed for the conservation of fresh and frozen goods. All ranges are suitable for cold rooms or, with low ventilation, for work rooms and packing areas.



- **Highly attractive** modern casing design
- **Turbocoil®** with exclusive LU-VE design
- **Jet streamer®** fan grid ensures even air distribution and longer air throw
- Also available for **A2L refrigerants**





ALFA LU-VE commercial unit coolers, since their first appearance over a decade ago, have become a hallmark in the high-end commercial refrigeration sphere.

They are suitable for both **small and medium-sized** refrigeration and freezing applications.



- **Industrial know-how** applied to commercial refrigeration
- **Rounded-edge design**
- **Full metal powder-coated casing**
- **Turbocoil®** with exclusive LU-VE design





HEAVY INDUSTRIAL AIR COOLERS



ARCTIGO belongs to a modern generation of LU-VE Group heavy industrial air coolers



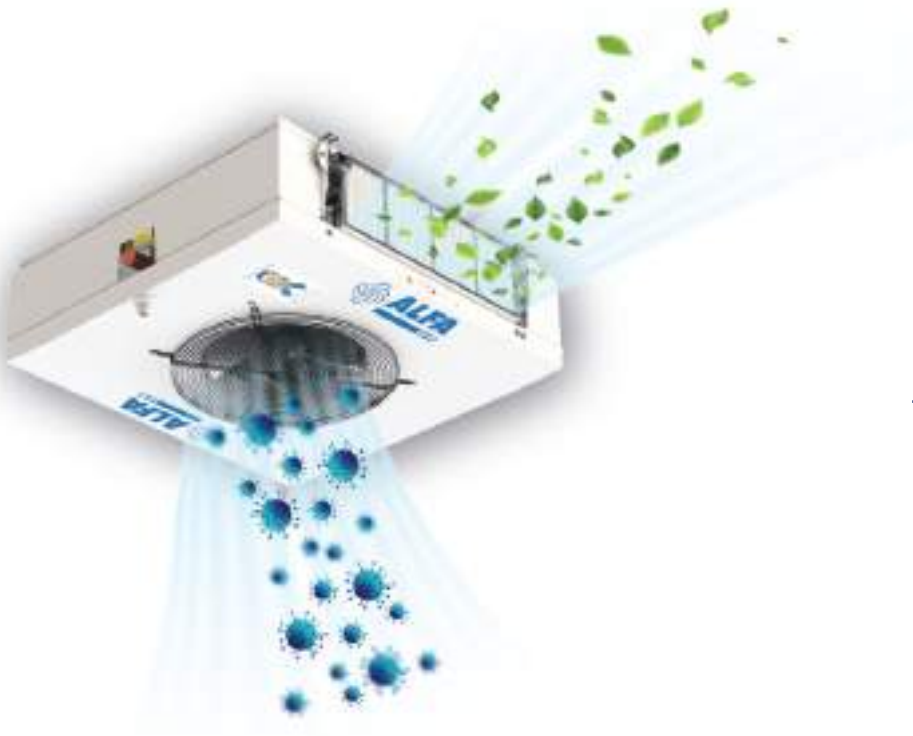
- **Improved preservation** of goods in the cold room
- **Application-led design**
- **Wide and versatile range**
- **Only first-class materials** used for long-lasting performance
- **Available for ammonia, CO₂ and brine**
- **Accessories to all applications**

Reliable

Heavy duty

Long-lasting
performance

IGEA is a patent-pending solution designed to sanitize indoor air and improve quality of life.



Tests conducted by the San Raffaele Hospital in Milan highlight the effectiveness of Igea on the viral load of SARS-COV-2, **neutralizing it completely in 30 minutes***



Igea prolongs the conservation time of goods, by up **to 10/15 extra days.***



SAFETY AND LOW ENVIRONMENTAL IMPACT

RETROFIT ON:



FMD



FHD

* Full information and conditions on www.luvegroup.com

LU-VE *Value Defender*

INDUSTRIAL AIR COOLERS OPTIMIZED FOR CO₂



LU-VE Group is a pioneer of natural refrigerants. In industrial refrigeration the «**Value defender**» air coolers **present an optimized design for CO₂.**

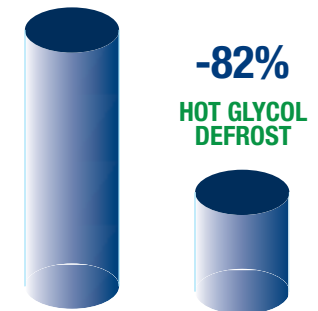
The Value Defender is **available with hot glycol defrost** with significant reduction in defrost running costs.



- **Optimized for CO₂**
- **TURBOFIN® 3** heat exchanger for **high efficiency operation**
- Only first-class materials used for **long-lasting performance**
- **Available with hot glycol defrost**

ANNUAL DEFROST OPERATING COST

Standard electrical defrost (4 cycles/day)



ARMÓNIA, the new range of NH₃ unit coolers, brings a brand new meaning to the low refrigerant charge concept:

- > **very low** ammonia charge (down to 0.07 kg/kW)
- > **minimized** circulation rate
- > **high-efficiency** specialized surfaces

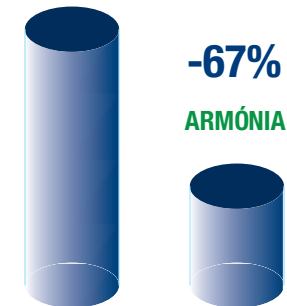


- > **Wide range** of models
- > **½" tube diameter**
- > **High performance** at low pump circulation rate (down to 1.8)
- > **Side feed** for co-flow operation
- > **Highly customizable**

Do you really need
so much refrigerant?

**AMMONIA
REFRIGERANT CHARGE**

Traditional market
solution



LU-VE Minichannel

ULTRA LOW-CHARGE CONDENSERS AND CO₂ GAS COOLERS

MINICHANNEL® compact technology allows **ultra-low refrigerant charge**:

- > **special louvered profile** aluminium fins
- > high-efficiency **Ø5 mm** inner grooved copper tubes
- > 3 times less internal volume compared to the market standards



- > **Wide range** of models
- > **EC** or **AC** fan motors (1ph / 3ph)
- > **Modbus** fan control
- > **Fan speed** control (0-10 V)
- > **Anti-corrosion** surface treatment (optional)

Do you really need
so much refrigerant?

CONDENSERS REFRIGERANT CHARGE

Traditional market
solution



-68%

MINICHANNEL®



Ø5 mm Adiabatic CO₂ gas cooler

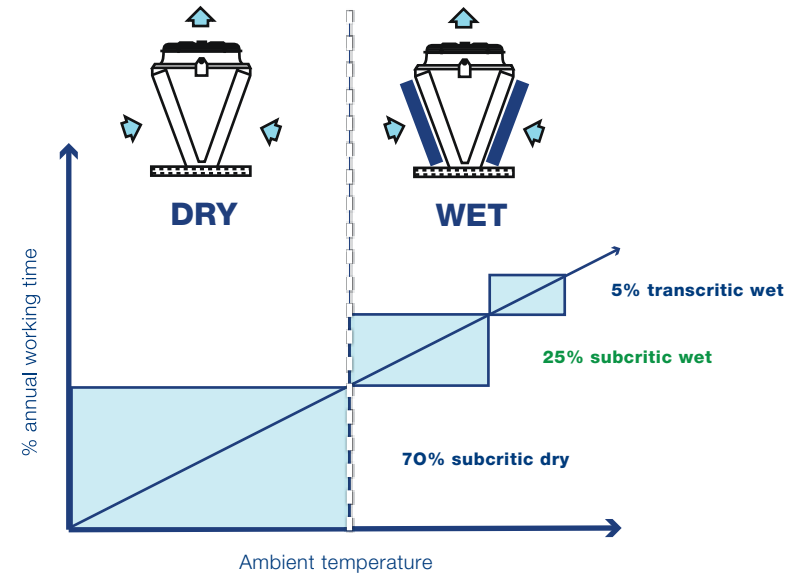
Adiabatic CO₂ gas cooler, new generation for transcritical applications:

> extends subcritical operations

> redraws the CO₂ equator



Propeller



Minichannel

HIGH-EFFICIENCY Ø5 mm HEAT EXCHANGERS

120 bar max working pressure

Extremely compact solution

Adiabatic System

PRE-COOLING SYSTEM

Increases the overall efficiency of transcritical systems

Advanced controller

Propeller

HIGH-EFFICIENCY ELECTRONIC RADIAL FAN MOTOR

High static pressure to canalize outlet air

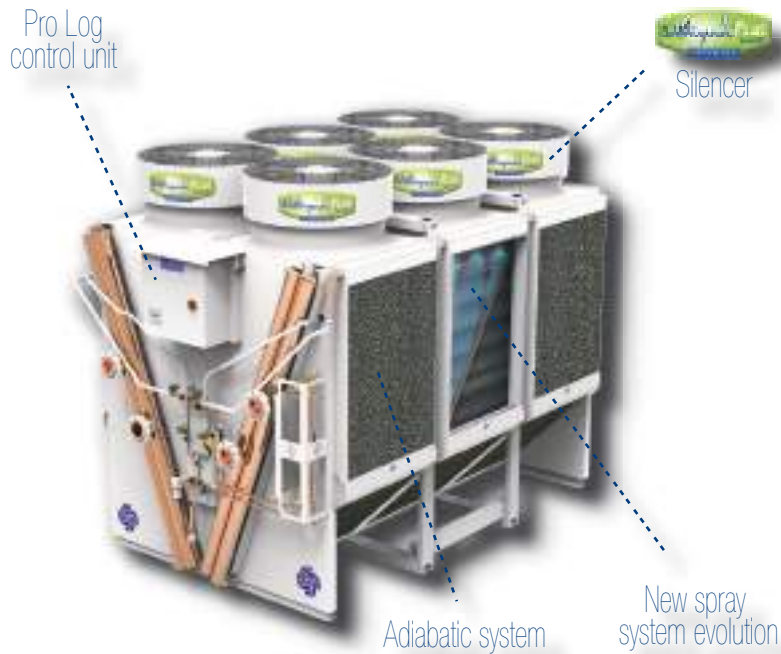
Heat recovery



NEW COMBINED SPRAY + ADIABATIC SYSTEM

EMERITUS® range of condensers, dry coolers and CO₂ gas coolers, brings together the benefits of:

- > spray system
- > adiabatic pre-cooling



APPLICATIONS

- > Air conditioning
- > Refrigeration
- > Industrial applications
- > Data center cooling

PLUS

- > Air conditioning
- > Refrigeration
- > Industrial applications



PRO LOG advanced control software, designed for air-cooled condensers, gas coolers and dry coolers with EC fans:

> **advanced functions**

> **adaptable** to all kinds of plants/installations



FUNCTIONS

- >> Fan lock prevention
- >> Coil cleaning
- >> Coil washing
- >> Winter function
- >> Anti-icing
- >> Operating pressure check
- >> Remote monitoring
- >> Silent mode
- >> Remote supervising
- >> Data logger
- >> Water quality check

TWO REGULATION MODES

- >> Proportional
- >> Incremental neutral zone (PID)

DOUBLE SET POINT

- >> Fixed set point
- >> Floating set point



User
friendly

Advanced

Adaptive

Connected

Reliable

Whisperer plus[®]



COMPACT SILENCER

HAVE YOU EVER HEARD THE SOUND OF SILENCE?

WHISPERER PLUS[®] is the second generation of **silencer specifically designed** for condensers, dry coolers and CO₂ gas coolers:

- > sound level reduction - **up to -6 dB(A)**
- > reduction of electricity consumption - **up to 19%**



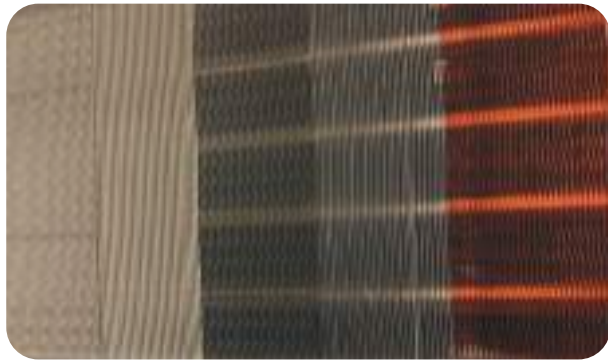
PLUS

- > Energy saving
- > Extremely quiet operation
- > Smaller unit footprint
- > Elimination of warm air recirculation



R-Fin™ is an innovative solution designed to provide increased mechanical and corrosion resistance in industrial environments, applicable both to coated or uncoated fins.

- > **Increased mechanical resistance**
- > **Long lasting performance** thanks to longer lifecycle
- > **Pre-coated fins** edge protected
- > **No thermal efficiency loss**



R stands for:

- > **R**einforced
- > **R**obust
- > **R**igid
- > **R**ounded
- > **R**evolutionary
- > **R**esilient

R an innovative solution for:

- > Industrial environments
- > Dirty environments
- > Particulate / Sand
- > Deep cleaning needs
- > High durability
- > Reduced maintenance requirement

Stronger

Protected

Reliable

Durable

REFRION ECOOLER

COOL GENERATION

THE ECO-FRIENDLY ADIABATIC PRODUCT RANGE FROM REFRION

Ecooler is designed to meet the increasing demand for free-cooling applications.

The Ecooler optimise the benefits coming from the adiabatic saturation of the air adopting a water recirculation system and EC fans.



- **Strong and stable frame**
- Components suitable **for corrosive environments**
- Maintenance door protected by a **security switch**
- Self-draining **water recirculation system**

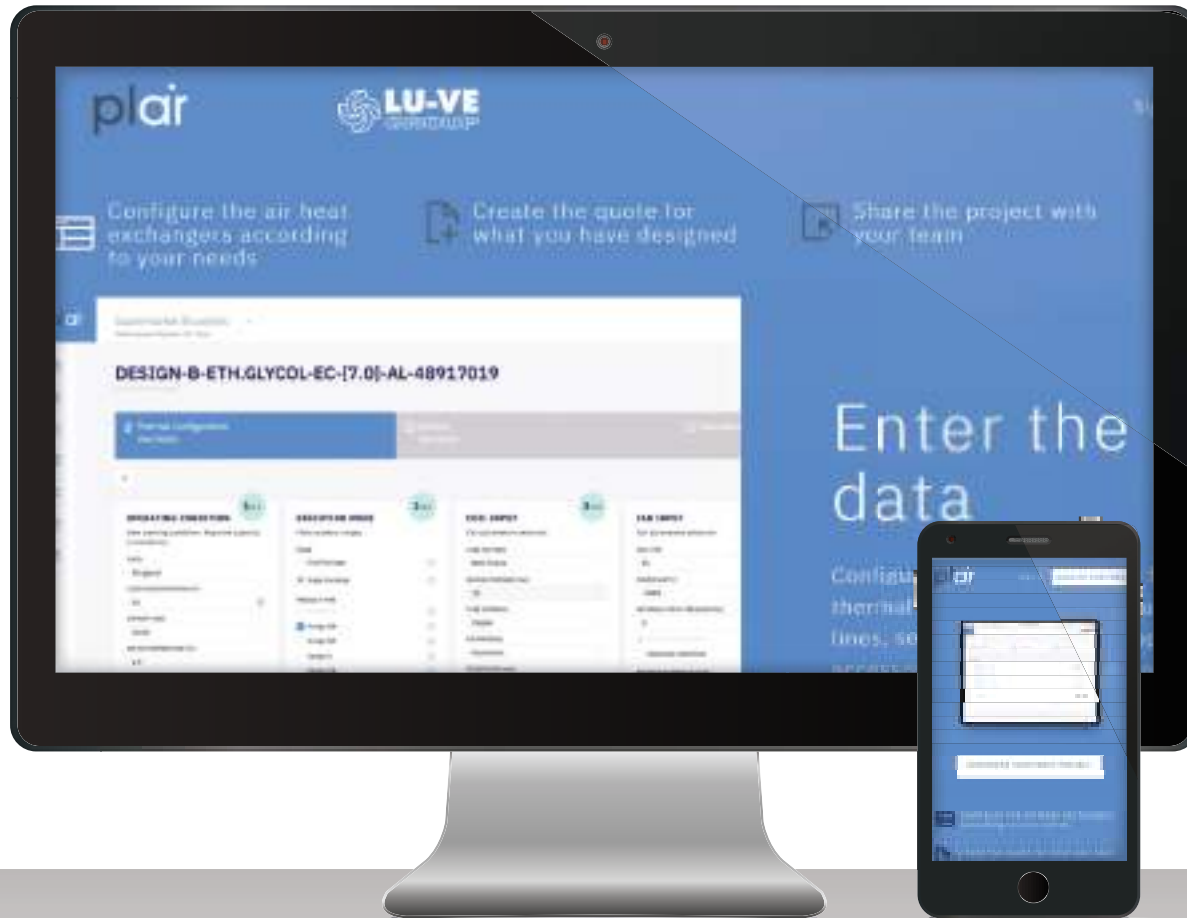




REMOTE CONDENSER FOR NUCLEAR PLANTS

- **2 circuits with independent control**
- Heat exchangers with **stainless steel tubes**
- **4 EC fans**
- High temperature circuit **2x107 kW**
- Fan diameter **910 mm**
- Air flow **63,600 m³/h**





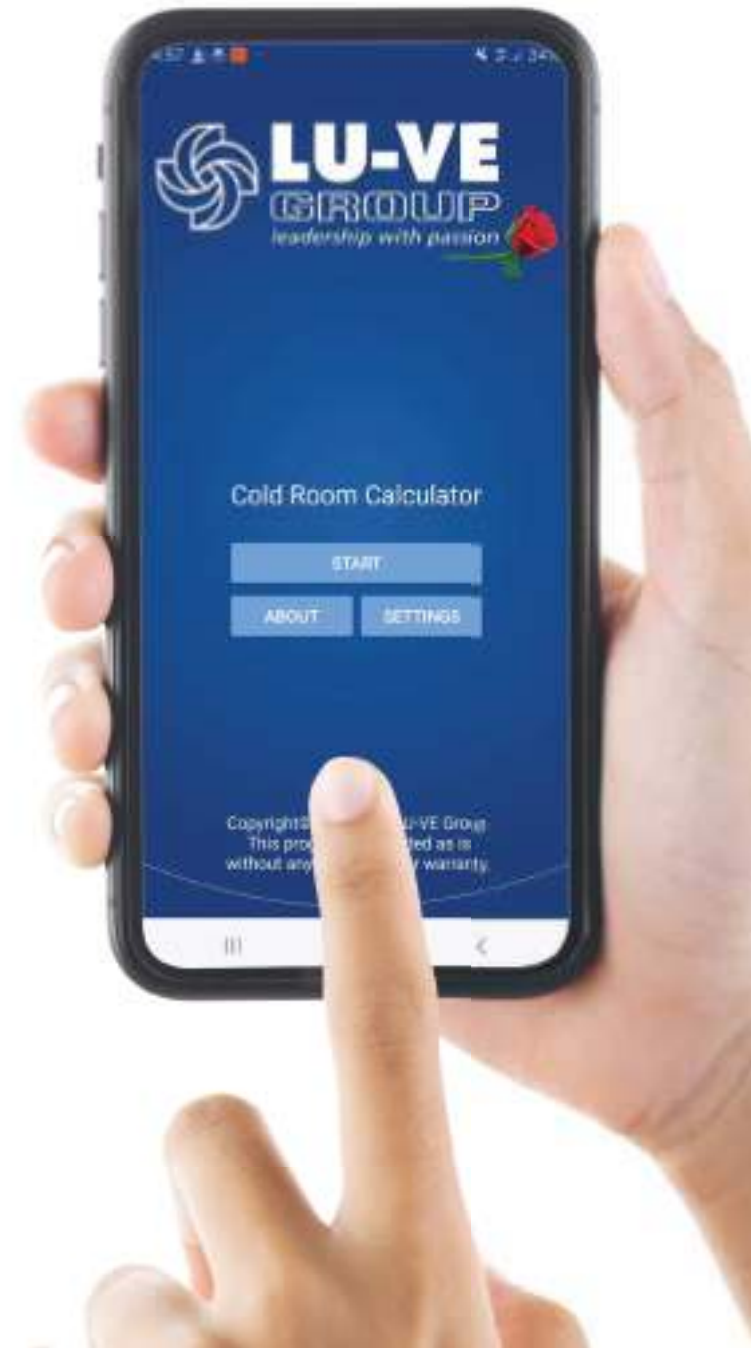
The **free** and
collaborative application
to configure air heat exchangers



Configure
Quote
Share



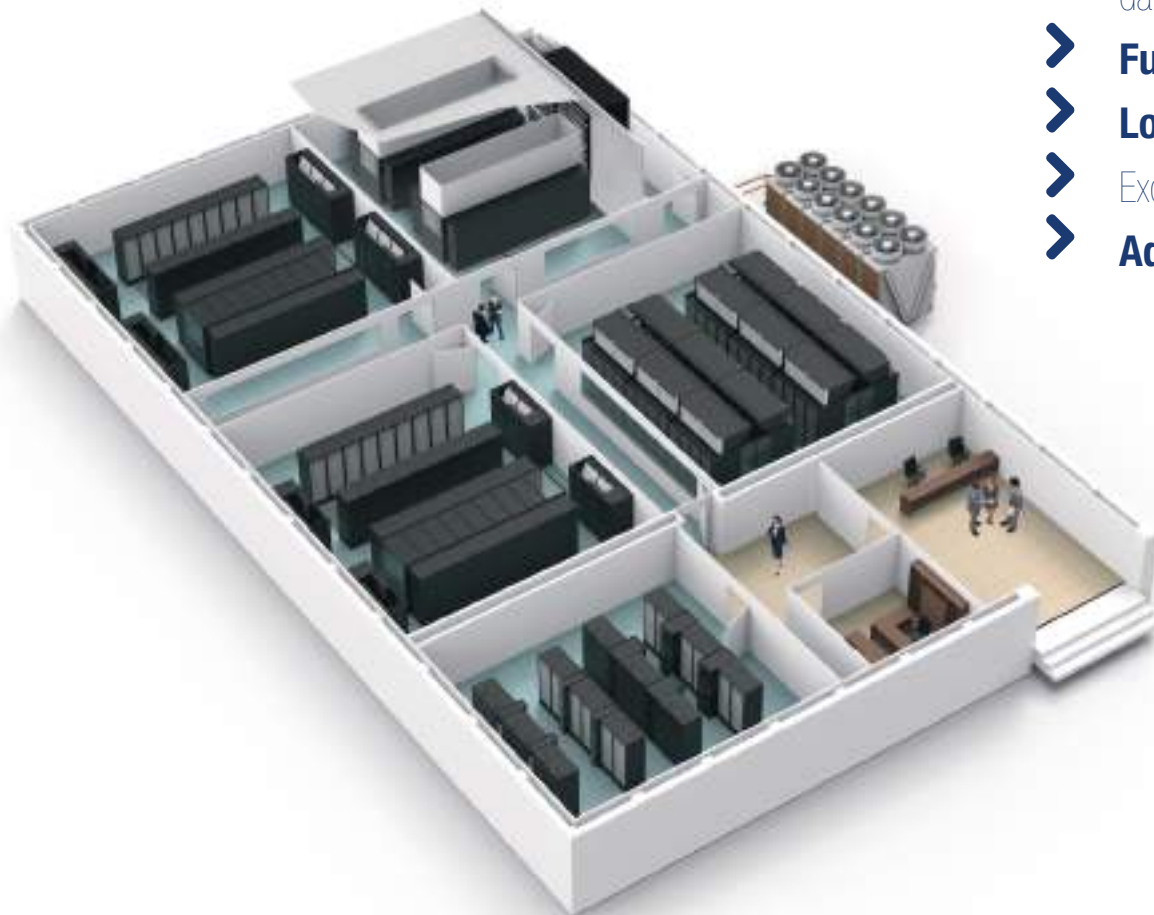
DOWNLOAD Cold Room Calculator



OVER 100,000 DOWNLOADS

Data center air conditioning

LU-VE Group can provide a wide range of solutions specifically designed for **data center air conditioning**.



- **Heavy duty and modular units** for indoor and outdoor data center cooling
- **Fully customized** according to data center characteristics
- **Low total cost** of ownership
- Excellent solution **in combination with free cooling**
- **Advanced regulation** for optimised performances



Arctigo^{LU-VE} LSV
Low speed ventilation solution



Emeritus^{LU-VE}
New combined spray + adiabatic system



VXX3
High capacity dry cooler



ECOOLER
Adiabatic system



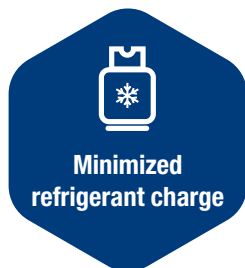
Heat exchanger
solutions

Thanks to the constant research and development led by **continuous innovation** in the manufacturing of heat exchangers, we are able to offer the best solutions for a wide variety of markets and applications operating (also in challenging conditions).

Our passion is there to satisfy market needs and to contribute **to a more sustainable world**.

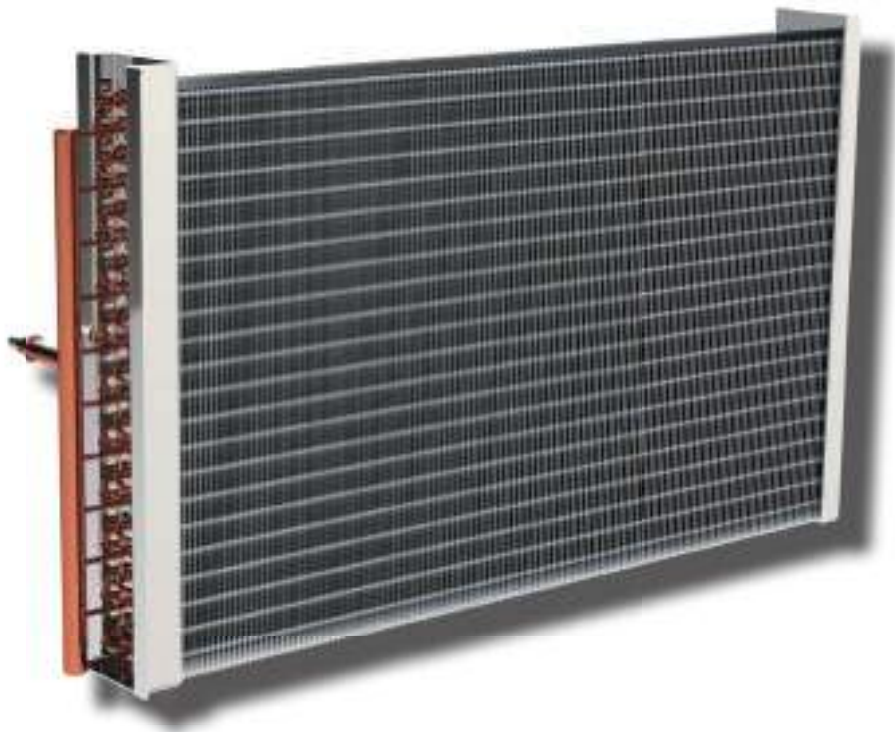


- **Tube miniaturization** = reduced refrigerant charge
- **High performance** heat transfer technology
- **Zero defect policy**
- **E-Genius:** dedicated calculation software
- Reusable packaging = **low carbon footprint**
- Proximity to customers = **reduced transport emissions**
- **Single-material:** full aluminium coils



New heat exchanger with 4 mm diameter tube

LU-VE Group research has led to the creation of a new heat exchanger with 4mm diameter tube which **improves performance by minimizing refrigerant charge.**



- Ideal solution **for residential heat pumps**
- Further **20% reduction of internal volume***
- **Reduced refrigerant charge**
- Safer use of **A2L refrigerants**
- **Less copper**, optimizing cost
- **Improved performance****
- **Lighter weight**
- Guaranteed production **flexibility**

*compared to 5 mm tube

**compared to traditional solutions with equal heat transfer surface



REFRIGERATION

Refrigerated display cases and serve-over counters
Positive temperature vertical and semi vertical cabinets
Negative temperature vertical and horizontal cabinets
Condensing units / Monoblocks



HVAC

Split / Condensing units
Chiller and heat pumps
(air to water units)
Roof top (air to air units)
Fan coil, cassette, terminal units
Chilled beams
AHU/Heat recovery



REFRIGERATED TRANSPORT

Refrigerated trailers and trucks
Refrigerated containers for marine application



HOUSEHOLD APPLIANCE

Heat pumps systems for
tumble dryer applications



VEHICLE AIR CONDITIONING

Railways
Automotive
Bus/Coach
Agricultural machines



RESIDENTIAL HEAT PUMP

Indoor/outdoor fin and tube heat
exchanger for heat pumps

Coils - fins and tubes

Each solution is engineered to fit the requirements of the market with tailor-made products.

The productive experience of LU-VE Group has always interpreted material and technology research as the real first step towards **proposing innovation.**

tubes



COPPER

Material frequently used in the production of heat exchangers, available with grooved or smooth internal surface, to guarantee operation at different pressures.



ALUMINIUM

Alternative material, providing a lighter and cheaper exchanger, facilitating its recycling.

FIN SURFACE

Alluminium and copper



FLAT

Flat fins have the lowest resistance to air flow and reduced ice accumulation.



CORRUGATED

Corrugated fins improve the heat transfer factor to a lower degree than louvered fins, but with a lower pressure drop on the air side.



LOUVERED

Louvered fins increase the heat-transfer capacity by creating air turbulence, considering the same exchanging surface.

FIN SURFACE TREATMENTS

Surface treatments available on request



HYDROPHILIC

With this treatment fins become hydrophilic and therefore "wetable", avoiding the formation of drops.



HYDROPHOBIC

Epoxy-based treatment that effectively inhibits dust and bacteria build up.



SUPER HYDROPHOBIC

Nanotechnology used to create a surface coating that guarantees high protection against corrosion and the deposit of dust.

Coils - technology

ADDITIONAL PROCESSES

BENT HEAT EXCHANGERS

For all applications in the air conditioning and residential heat pump sector, where specific flexibility and restricted dimensions of the finished product is requested, LU-VE provides its customers shaped exchangers with various radii of bend. Typical applications are: chillers, heat pumps and cassettes.



PROTECTION YOU CAN TRUST

CATOCOAT



CATOCOAT is the tested and guaranteed **coating technology** which LU-VE has been offering to its customers **since 1996** and which today has evolved even further using new technologically advanced equipment.

The main advantages of the CATOCOAT technology are:

- Extensive and regular treatment in any complex shapes
- **Thin film**
- **Corrosion resistance** in salt spray test > 1,000 hours
- **Better resistance** compared to the other powder treatment technologies and pre-coated raw materials
- **Food products compliance**
- Low environmental impact thanks to the use of water-based paints and state-of-the-art installation works

EXCLUSIVE TECHNOLOGY

ST: Standard steel condensers



Tubeless steel heat exchangers.

Over 26,000,000 units manufactured up to 2022 using a unique patented method.

The combination of high mechanical strength and anticorrosion treatment make it ideal for applications without physical protection.

Thanks to its structure, fin cleaning can easily be done with compressed air.



TGD

Thermo Glass Door

Thermo glass doors & interactive mirrors

Since 2000, **TGD has been producing glass components for commercial, industrial, professional and scientific refrigeration markets.** Our aim is to offer our customers the highest efficiency solutions to reduce the energy consumption of their products, increasing their commercial value. **Our mission: to contribute to a better world.**



- **Hang-on doors** for commercial, professional and laboratory refrigeration
- **Line-up doors** for supermarket, cold rooms and mini line up
- **Glasses:** thermo insulated, warm edge assembled, heating glasses and digital silk screen
- **Accessories:** Soft Closing System and customized handles

A wide range of solutions



LT WALK-IN GLASS DOOR SYSTEM

66 - 76 Negative temperature application



NT WALK-IN GLASS DOOR SYSTEM

66 - 76 Positive temperature application



ROLL-IN GLASS DOOR SYSTEM

Maxi wide door



HANG-ON DOORS



E-CUT SLIM

Entry level swing doors



E-CUT SLIDING

Entry level sliding doors



European
standard
dimensions

Reliability

Easy
cleaning

Antifog



E-CUT WIDE LOOK

Full glass look



Mirabilia^{by TGD}

Full transparent look - top of range



MAX LINE

The most diffused



MAX LINE E/S

The energy saving solution



WIDE LOOK LT

The top level solution



GREEN GAS HEATED FRAME

The best solution for plug-in cabinets



«0 energy»
frame

Adaptability
to any operating
condition

Certified
quality

Great
visibility



Digital Signage Solutions

Since 2017, LU-VE Group and TGD have developed new ranges of products, for applications not only in the field of the HVACR industry, but also **new market products, taking advantage of the IoT technology.**



The IoT mirror for lift cars



Gateway applies **IoT technology** to the mirrors in lift cars, transforming them into communication systems, connected to the internet.

The mirror becomes a system for selling commercial information; turns into a two-way audio/video communication system with 24/7 assistance service.



Smart mirror display



Luxury Mirror Television is a digitally animated mirror that becomes a TV screen.

Thanks to its high-tech elegant design, iMAGE finds its natural position in high-end hotels (halls and bedrooms), yachts, bars and restaurants, spas, fitness centers.



Transparent interactive door for refrigerators



Magic Vision is the glass door for commercial fridges and freezers:

- displays videos & images
- touchscreen mode
- integrated mode: manages cameras, lights etc.
- visual recognition system for data collection



LU-VE GROUP AND MASERATI: WHEN EXCELLENCE MEETS EXCELLENCE

LU-VE Group is proud to contribute to the cooling of the **Engine Lab of the Maserati factory in Modena, Italy.**

A special air cooler from the “Value Defender” range serves the laboratory where the historic Italian car company is developing the new “Folgore” model, an all-electric sports model.



www.luvegroup.com



OUR BEST DAYS HAVE YET TO BE LIVED

Nazim Hikmet

