Kelvion

Product Line: Cooling Towers

MODULAR & SUSTAINABLE SOLUTIONS

Kelvion

EXPERTS IN HEAT EXCHANGE – SINCE 1920

Welcome to Kelvion! Where Heat Exchange is our Business. We are one of the leading global manufacturers of heat exchangers and have been providing solutions for almost every industrial application imaginable since the 1920s, specializing in customized solutions suitable for extreme environmental conditions - as of 2015 under the name of Kelvion.

With one of the most extensive selections of heat exchangers in the world, we are a well-known partner in many industries, including transportation, energy, oil and gas, the heavy industry, chemical and marine as well as sugar, food and beverage and the HVAC and refrigeration technology sector. Our products include Compact Fin Heat Exchangers, Plate Heat Exchangers, Single Tube Heat Exchangers, Transformer Cooling Systems, Cooling Towers and Shell & Tube Heat Exchangers.

Our many years of experience and in-depth expertise have made us specialists in this field. Our heat exchangers are designed specifically to meet the needs of the respective machine or equipment system, ensuring outstanding energy efficiency and reliability in any market segment. This gives our customers a cutting-edge over their competitors while also reducing operating costs over the long term.

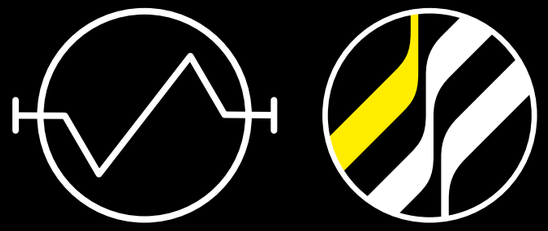
As your heat exchange partner, we understand that outstanding and reliable after-sales services are critical for you, our customer, and we work alongside with you in close partnership supporting you throughout the full life cycle of your plant and equipment to ensure lasting business success.

Kelvion – Experts in Heat Exchange.

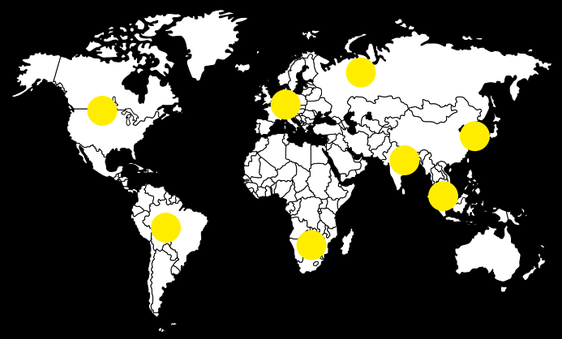
KELVION – A TRIBUTE TO LORD KELVIN (1824 - 1907)

Lord Kelvin formulated the laws of thermodynamics and absolute units of temperature are stated in kelvin, in his honor.

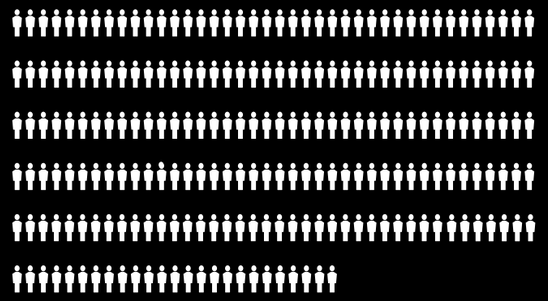
OUR LOGO – INSPIRED FROM THE SCHEMATIC FOR HEAT EXCHANGER



67 BRANCHES AND SALES PARTNERS WORLDWIDE



4,500 EMPLOYEES WORLDWIDE



YOUR MARKETS ARE OUR MARKETS

- Chemicals
- Food & Beverages
- Heavy Industry
- HVAC
- Refrigeration
- Marine
- Oil & Gas
- Power
- Sugar
- Transportation

KELVION HAS A LONG HISTORY

2015 With the new name, the former GEA Heat Exchangers is writing its own history as Kelvion.

2014 GEA sells the Heat Exchangers Segment to Triton.

2010 Reorganization of GEA's 9 Divisions into technologically distinct Segments. The largest segment is the Heat Exchangers Segment.

1999 In April 1999, GEA was acquired by mg technologies AG

1920 Foundation of GEA in Bochum by Otto Happel sen. (Born 1882)

We invest in Quality and Sustainability

CUSTOM-MADE FROM STANDARD COMPONENTS

Kelvion designs, manufactures and services cooling towers for process and climate cooling. Our durable and environmentally-friendly cooling towers are expertly engineered to the highest quality standards for years and work free operation. Our extensive cooling tower portfolio includes open evaporative cooling for nearly any quantity type water.

Kelvion cooling towers combine high cooling capacity with low energy consumption. The modules are ready to use and easily to adjust to cooling requirements and available space, whether they are operated individually or in-line. The cooling performance of these cooling towers is optimal and operation is problem free.

Evaporative cooling is the most efficient and sustainable way to make cold water. The high efficiency axial fan provides the lowest energy consumption per rejected kilowatt of cooling. The use of highly corrosion-resistant construction materials allows a high concentration factor with a minimum of water consumption. Together with the long lifecycle of the equipment, the cooling tower ensures a green footprint.

APPLICATIONS

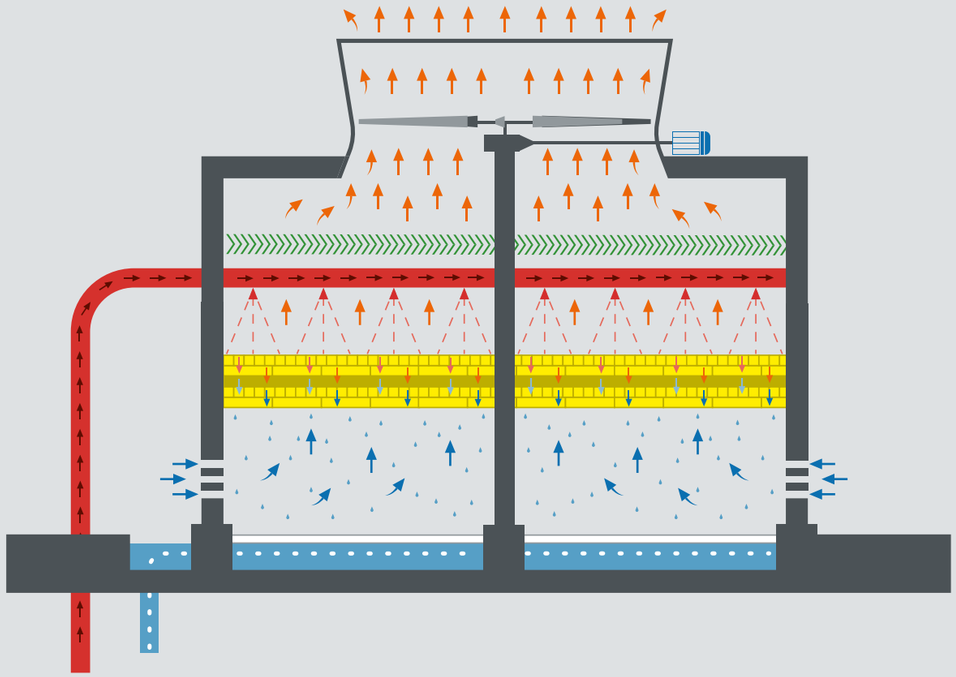
- HVAC
- CHEMICALS
- POWER
- HEAVY INDUSTRY
- FOOD
- OIL & GAS
- DATA CENTER

WHY CHOOSE KELVION COOLING TOWERS?

- Over 50 years of experience in the development, design, production, installation and maintenance of cooling towers
- Modular products available for any size
- Extreme durability by using high quality materials like stainless steel, glass fiber-reinforced plastics and thermoplastics like polypropylene/polyvinylchloride
- Proven record cooling tower lifetime of more than 40 years
- Wide range of models in counterflow certified in the thermal rating program of the Cooling Technology Institute (CTI STD201)
- Customizable to your demands by our experienced sales engineers

ENVIRONMENTALLY-FRIENDLY COOLING PERFORMANCE

OPERATION PRINCIPLE COUNTERFLOW



Evaporative Cooling
All cooling towers technology is based on the evaporation of water into the air. Therefore the inlet wet bulb temperature determines the performance of the cooling tower. The gap between wet bulb temperature and required cold water temperature determines the size of the unit. This may result in water that is colder than the ambient dry air temperature.

With the exception of mechanical cooling with refrigerants, evaporative equipment is the only cooling technique to achieve this result. Typical COP values of 80 - 120 are achievable.

The Effect of Counterflow
The principle of counter flow used in Kelvion cooling towers means that the water flows down while the air is drawn upwards by a fan. Counterflow cooling towers can reach the wet bulb temperature more effectively, compared to crossflow cooling towers. The cooling is generated by evaporation of approximately 1% of the circulating water. The direct contact between water and ambient air is created over the surface of plastic fill.
The cooling towers have a counter flow configuration that provides the most efficient exchange of enthalpy and the coldest water.

SUSTAINABLE & EFFICIENT COOLING

Modules to size
The cooling water temperatures (inlet and outlet), the wet bulb temperature, noise and the water load are the four most important criteria when selecting a cooling tower model.

Kelvion analyzes the requirements together with the client and uses it as a basis of the design for a suitable solution. The modular Kelvion cooling tower can be extended, and standard solutions are available for different capacity needs. Kelvion engineers make customized changes to meet client expectations.

Noise reduction
Usually, cooling towers are located outdoors and installed on a roof or at the edge of the site. The noise produced by the axial fan, falling water and the electrical (geared) motor may require additional noise reduction measures.

Kelvion has extensive experience with noise reducing solutions. These include larger fans (lower speed, less noise and higher efficiency), floating silencers to reduce the noise of splashing water and other noise reducing devices.

Using detailed calculations, we identify the cause and level of noise. Kelvion can also make calculations for all cooling towers in accordance with all environmental regulations.

The security of quality
Kelvion designs and manufactures durable cooling towers minimal maintenance requirements. This is achieved by using highest quality materials such as stainless steel, combined with glass fiber and technical plastics.

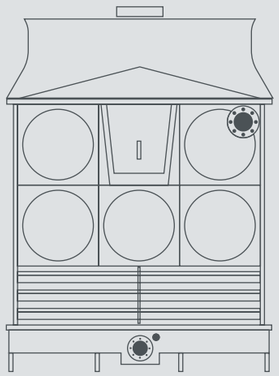
The result is a cooling tower that requires low maintenance, is energy efficient, and provide exceptional performance.

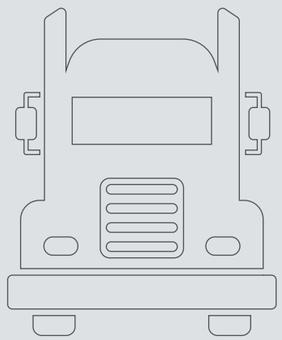
Advice and service
Kelvion builds cooling modules that meet most international industrial standards including ISO, VCA, VDMA, CTI and Eurovent.

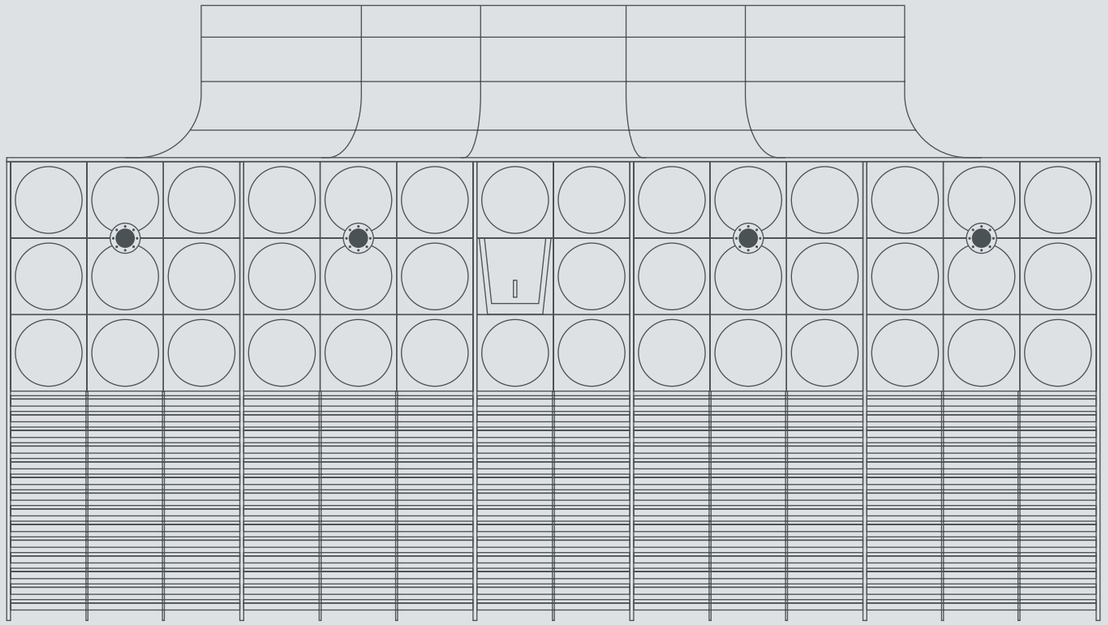
Our sales engineers advice, analyze and design the highest qulity products to your specifications. Thereby ensuring your receive a superior product, on time to increase your performance while reducing costs.

Kelvion's service facilities also specialize in cooling tower maintenance. For most OEM brands, our maintenance specialists are well versed in CT maintenance and are worldwide to assist with scheduled

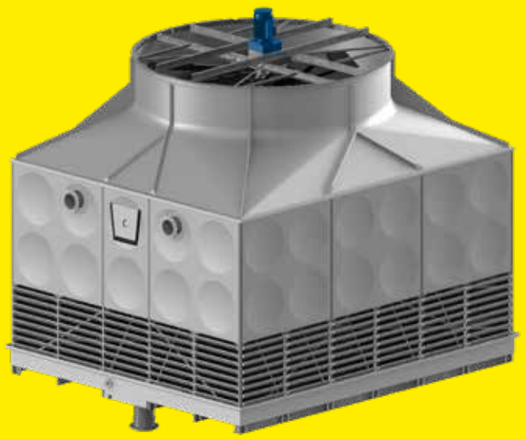
THE WIDEST SELECTION ON THE MARKET





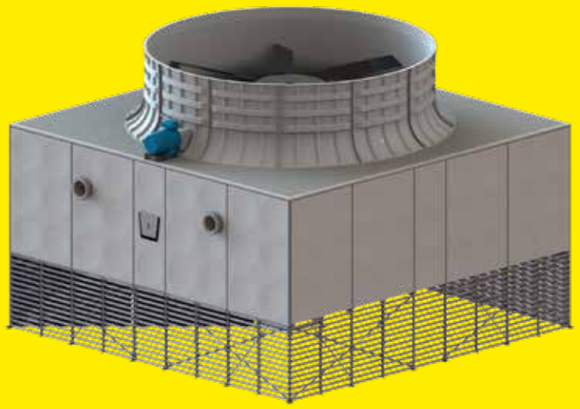


POLACEL SERIES



- Counterflow principle
- Cells can be positioned on concrete basin or delivered with integrated FRP basin
- Direct fan drive with geared motor provides economic solution
- Small modules can be pre-assembled in our premises while larger modules are assembled on site and hoisted during short maintenance stop
- CTI certified

ARCTICEL SERIES



- Counterflow principle
- B2B or in-line configuration
- Can process large quantities of water and has a substantial cooling capacity, up to 300 m^2 [3229 ft^2]
- The motor drive line is classical mounted on a torque-tube. A walkable fandeck provides easy access.

STRUCTURAL AND FUNCTIONAL FEATURES

The Polacel counterflow series is characterized by a combined motor gearbox unit that is mounted directly on top of the cooling tower above the axial fan. Kelvion offers a wide range of models with thermal capacities up to 30 MW per cell.

Cells up to 21 m^2 [226 ft^2] can be delivered pre-assembled. Larger cells up to 150m^2 [1615 ft^2], Polacel cooling towers, can be easily assembled on site, due to the limited number of parts that only have to be mounted mechanically. No cutting, grinding and welding on site. Simply using the manuals with 3D instructions.

The large cooling tower cells of the Arcticel series have a classic configuration with a foot motor outside the airflow and a right angel gearbox, which provide an accessible fan deck. These large cells up to 300m^2 [3229 ft^2] will be mechanically assembled on site. Kelvion can build these cooling towers in a short time frame thanks to the flexible and easy construction offered by the Kelvion Smart concept.

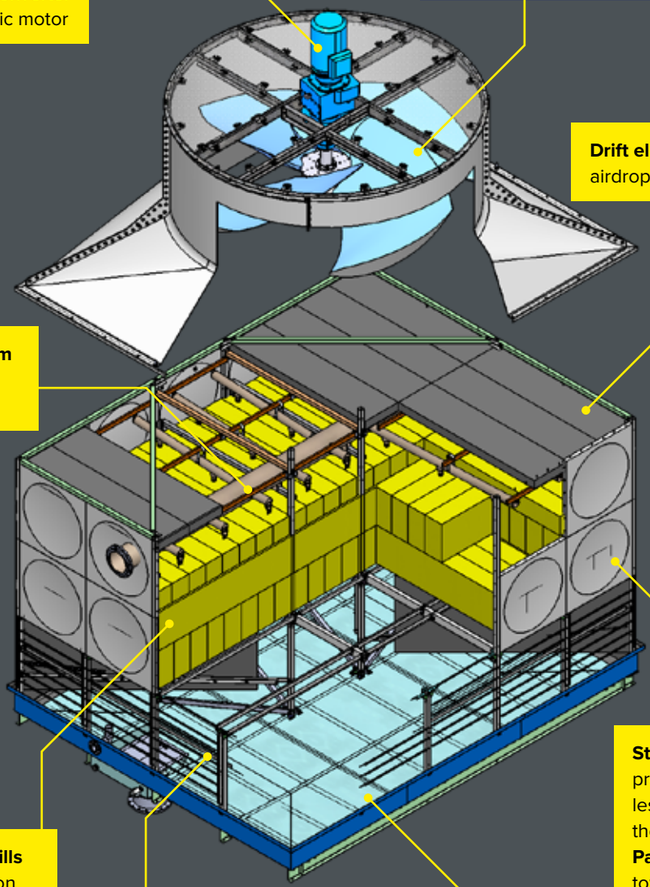
All the Cooling Tower units can be assembled prior to a shutdown (alongside the existing operating cooling tower) and then be hoisted as a complete unit and installed on the existing water basin during the shutdown. This is why the delivery time of a Kelvion cooling tower always fits into your schedule.

ADVANTAGES

- Only a minimum number of support points are necessary due to the self-supporting foundations and high internal stiffness.
- Completely hoistable, ready to be installed.
- All Cooling Towers can be delivered with an integrated water basin and/or mounted on a concrete water basin.
- The extendable modular system has virtually no limitations in terms of form and size.
- The standardized models have been analyzed and tested by dynamic strength calculations and meet the most challenging climate conditions.
- The aerodynamic design of the large fan section ensures lower energy consumption and a substantial reduction in noise.
- Several types of fans can be selected depending on preference and noise conditions.
- The spry nozzles water distribution system will be set to the required flow.
- Based on the expected water quality conditions a wide range of fills can be applied.
- High efficiency drift eliminators are available for each cooling tower.
- Different types of air inlet louvres are also available. They optimize the air inflow and minimize water losses through splashing.
- Floating silencers minimize noise caused by falling water.

Polacel Series

MAIN COMPONENTS AND INTERNALS



Drive unit comprises low maintenance speed reducer and electrical motor. Variable speed by frequency converter or permanent magnetic motor

Ventilators of different materials for standard high efficiency. Slow turning, low noise ventilators and vibration control. Axial ventilators give minimal power consumption and a maximal COP value.

Drift eliminators to minimize airdrops leaving the towers

Water distribution system with low pressure, non-clogging spray nozzles.

Structure made of strong profiles in high-grade stainless steel. In combination with the typical Polacel thick **Wall Panels,** it gives the cooling tower a high resistance to corrosion and a long lifetime (40 years).

Heat and mass transfer fills to optimize the evaporation of water. Different types of fills for application with clean water, industrial or grey water, polluted water.

Air inlets and wind-blockers avoid water losses, reduce growth of micro-organisms and stabilize cooling tower performance.

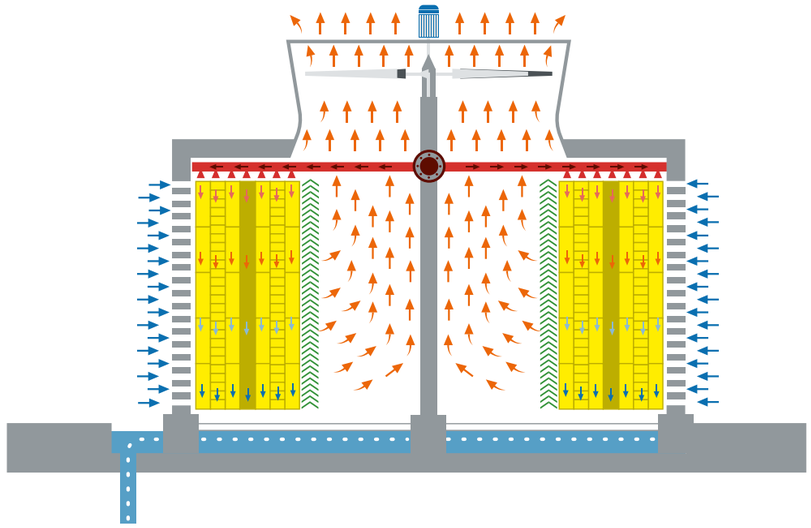
Integrated water basin with bottom on grade provides easy emptying, cleaning and disinfecting the cell.

Cooling Tower Models – Crossflow

ECONOMICAL & QUIET COOLING

XT - XM - XL – SERIES

OPERATION PRINCIPLE CROSSFLOW



The Kelvion crossflow cooling tower operates quietly and economically with high cooling capacity. The modular system can be easily adjusted to suit cooling requirements and space available for an optimal performance and worry-free operation. The considerable savings in water usage (95%+), and the exceptionally low noise level make the Kelvion crossflow cooling towers the best choice the environment.

The Effect of Crossflow
Using the crossflow principle, warm water flowing down through a cooling unit is cooled by air drawn upwards by a fan. Evaporation and direct heat transfer cause the temperature to fall rapidly. Compared to counterflow cooling towers, induced draft Polacel crossflow cooling towers are much quieter and smaller.

Kelvion Tundracel: Co-Current Closed Circuit Cooling Tower

KELVION TUNDRACEL
ORIGIN OF PROCESS COLD

Spray System

Gear Motor

Coil

Higher production capacity, lower energy costs and reduced water consumption with the new super cool Tundracel.

The new Kelvion Tundracel Co-Current Closed Circuit Evaporative Cooling Tower will boost heat transfer efficiency while using less energy and water.

This latest innovation in the Kelvion product portfolio is ideal for a wide range of heavy duty industries including oil & gas, refining, petrochemicals and power. The Tundracel uses evaporative cooling to remove heat from a process stream.

With the co-current closed circuit technology, the air helps to spread the water evenly over the entire surface of the tubes, causing less scaling and fouling.

Heat transfer is more efficient than in a traditional air-cooled heat exchangers, thereby creating the coldest possible cooling performance for the process fluid. As a result, electricity consumption is lower, reducing the environmental footprint and increasing production capacity.

Water costs are significantly lower with the Tundracel as it is designed to handle water of poor quality, such as blowdown water from a cooling tower, treated waste streams, plant effluent and sea water, as make-up water.

INDUSTRIES

OIL & GAS

CHEMICALS

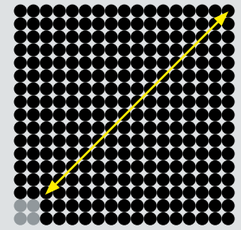
POWER

DATA CENTER

ADVANTAGES

- Colder outlet temperature (Single approach temperature)
- For poor water application (Waste streams, Plant effluent, etc.)
- Reduced water consumption
- Reduced electrical consumption
- Reduced footprint

CAPACITY RANGE



300 m² [3229 ft²]

4 m² [43 ft²]

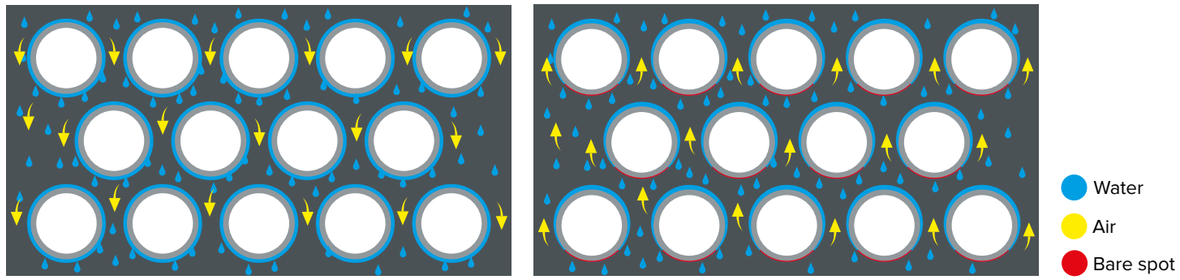
PROCESSES & MEDIA

LIQUID COOLING
- Water
- Industrial Wastewater
- Seawater
- Stripped Water
- Scrubber Waters
- De-ionized Water
- Glycol
- Machine Oils

VAPOR CONDENSING
- Steam
- Ammonia
- Freon
- Propane
- Acetone
- Cyclo-butane
- Ethane
- Methane

GAS COOLING
- CO_2
- Natural Gas
- Air
- Nitrogen

FUNCTION AND PRINCIPLE



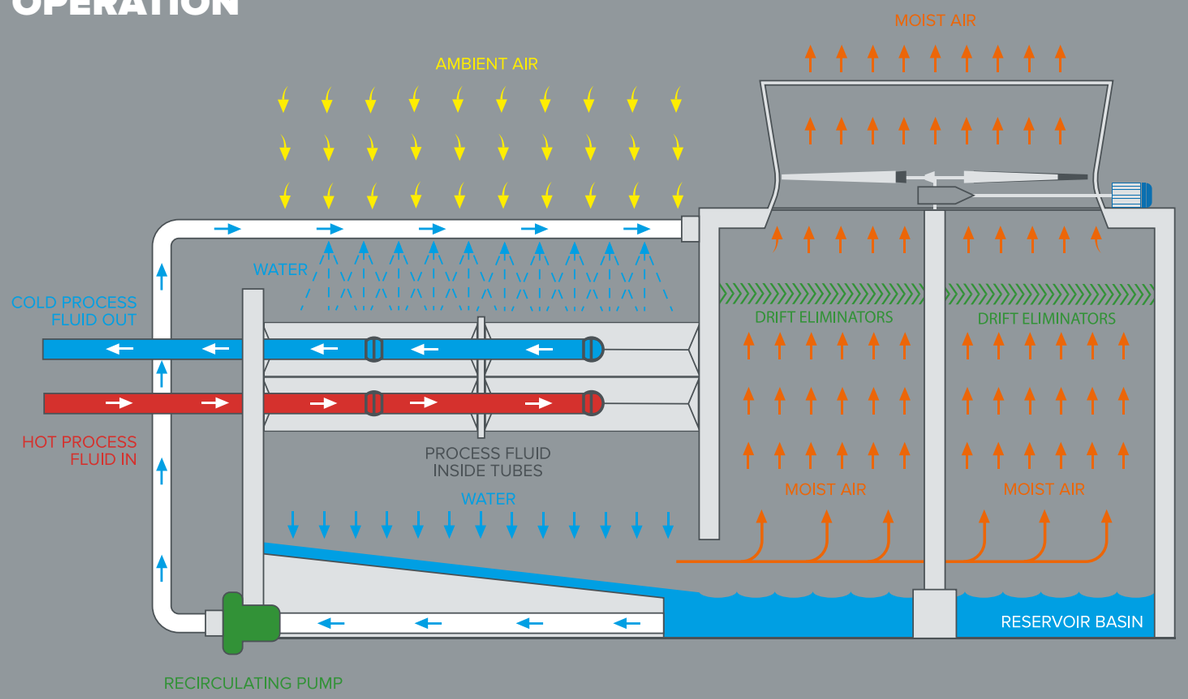
CO-CURRENT AIR & WATER

- Water and cooling air flow simoultaneously through the same current
- Improved Water Film
- Air helps to spread water evenly over entire tube surface
- Prevention of bare spots
- Less scaling / fouling

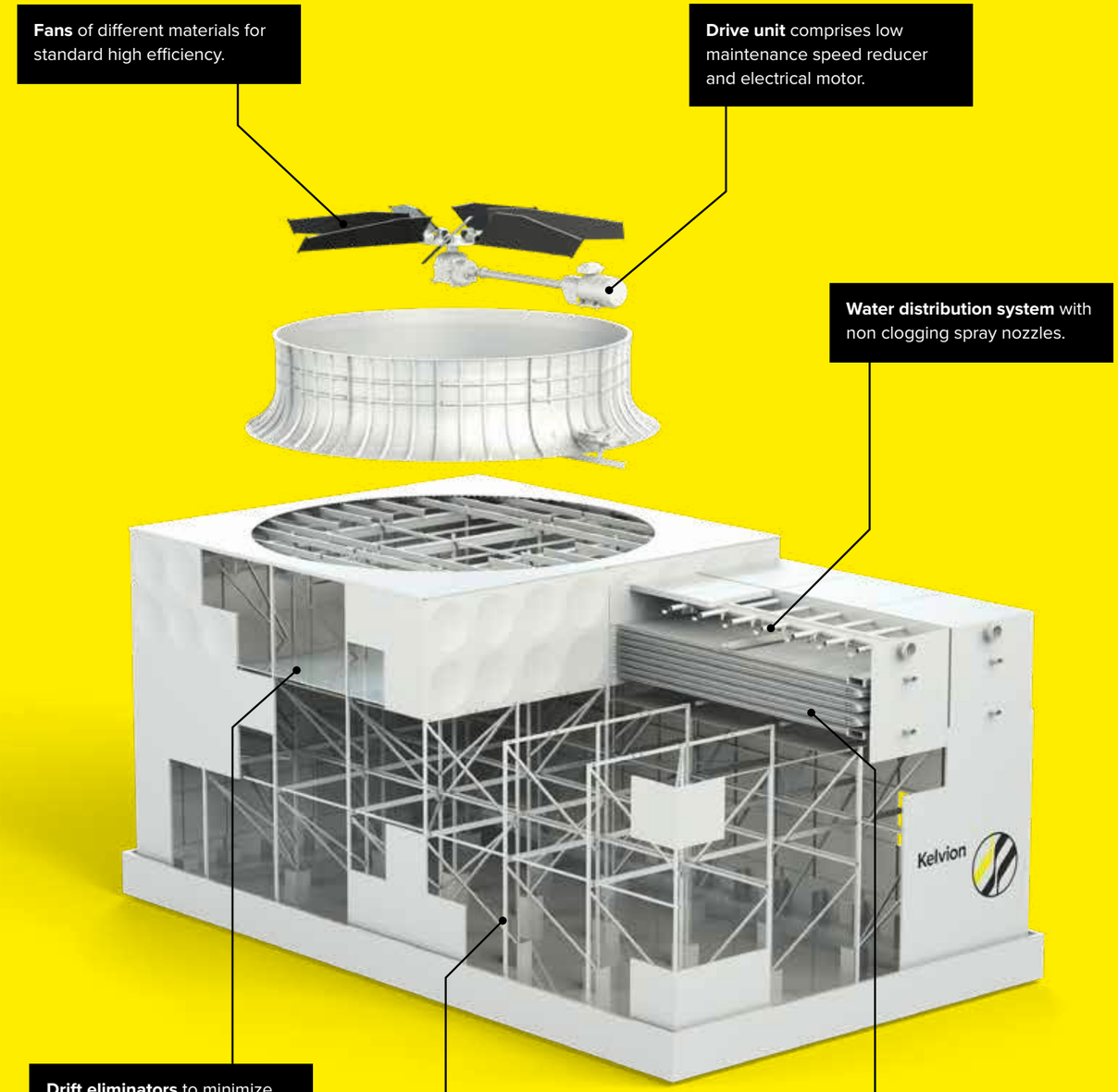
COUNTER CURRENT AIR & WATER

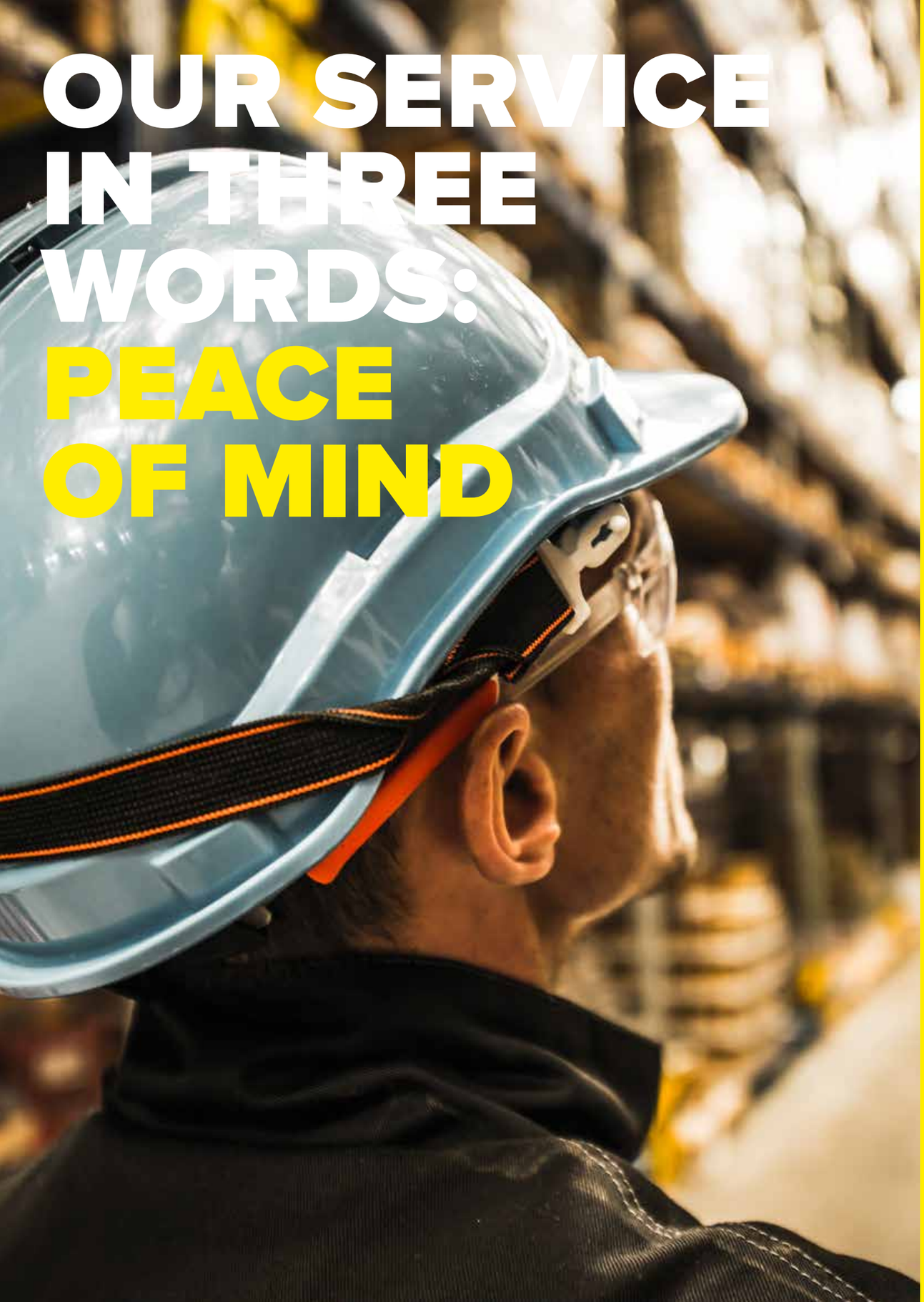
- Water flows down while the air is pulled upwards by a fan
- Counter flow cooling approaches the wet bulb temperature
- Air and water collide on the bottom of the tube causing bare spots

OPERATION



COMPONENTS & INTERNALS





OUR SERVICE IN THREE WORDS: PEACE OF MIND

START-UP SERVICES
We ensure that our products are delivered safely and are fully validated to give a robust and reliable performance over as long a life cycle as possible.

- Design, manufacturing, delivery, erection and commissioning
- Supervision of construction on site
- Commissioning assistance
- Assistance to erection sub-contractor

REPAIRS AND OVERHAULS
We understand that unscheduled downtime can be disastrous. That is why our trained engineers are ready to respond quickly in an emergency. We will review and repair components while keeping any disruption to a minimum. Any overhaul work and conforms to the highest quality standards.

- On-site diagnosis Overhaul
- MTBF improvement

SPARE PARTS AND SPARE PARTS SOLUTIONS
Even the best equipment shows signs of wear over time. We use only the highest quality spare parts, designed to match the excellence of the originals. This ensures that the optimum interaction between components is maintained. By safeguarding the original design we offer maximum security of your investment.

- Design, manufacturing and testing
- Spare trade parts
- Certified interchange-ability of spare parts

INSPECTIONS AND MAINTENANCE
Through regular inspections and maintenance, we help you to reduce costs, extend the lifetime of all your Kelvion products and to achieve a reliable performance. This also helps you with budget planning.

- Preventive & corrective maintenance
- Cleaning
- Disinfection of the cooling tower circuit
- Renovation and revision
- Oil change on gearbox

TESTING AND MONITORING
Having an understanding of the condition of the equipment allows you to secure reliable production, improve safety and energy efficiency and increase equipment lifetime. It can also help you to prevent breakdowns and prepare for the future.

- Process temperature analysis
- Noise pressure testing
- On site thermal performances tests on any cooling tower
- Vibration analysis
- Airflow testing
- Fan speed
- Legionella test
- CFD modelling

CONSULTING AND TRAINING
Would you like a consultancy service that takes into account the special features of your process and were you feel that finding the right solutions are more important than closing the deal quickly? Then you will feel right at home with Kelvion. We will work closely with you to develop the exact solution that is best tailored to your needs.

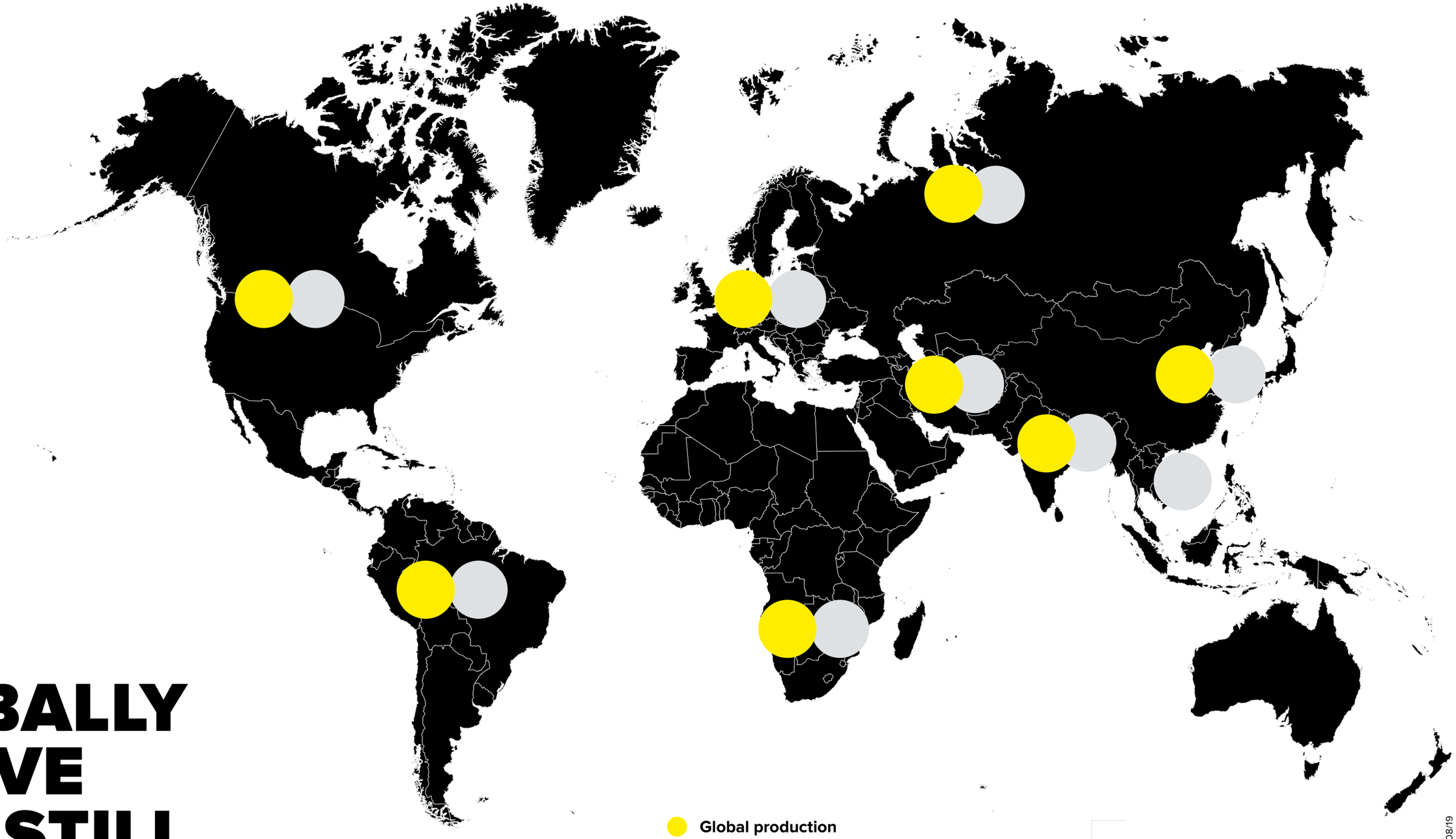
- Development of solutions to increase performance, efficiency and reliability
- Training of operators at site

UPGRADES AND REPLACEMENTS
We replace components to keep our heat exchangers running smoothly and to prevent downtime. Where parts have become obsolete, we will suggest an upgrade.

- Analysis and assessment of performance bottle-necks

GLOBALLY ACTIVE AND STILL CLOSE BY

No matter where your market is, regardless of country, we are never far away. We are always happy to answer any questions you may have and meet your requirements. Even the largest, most successful project begins with an initial, profitable conversation. We look forward to hearing from you.



Global production footprint

Global sales and service

Just scan this QR code with your smartphone or visit our website at: www.kelvion.com – there you will find a highly competent contact in your immediate vicinity.

www.kelvion.com