Kelvion

Up to 400°C / 750°F
and 50 bar(g) / 725 psi

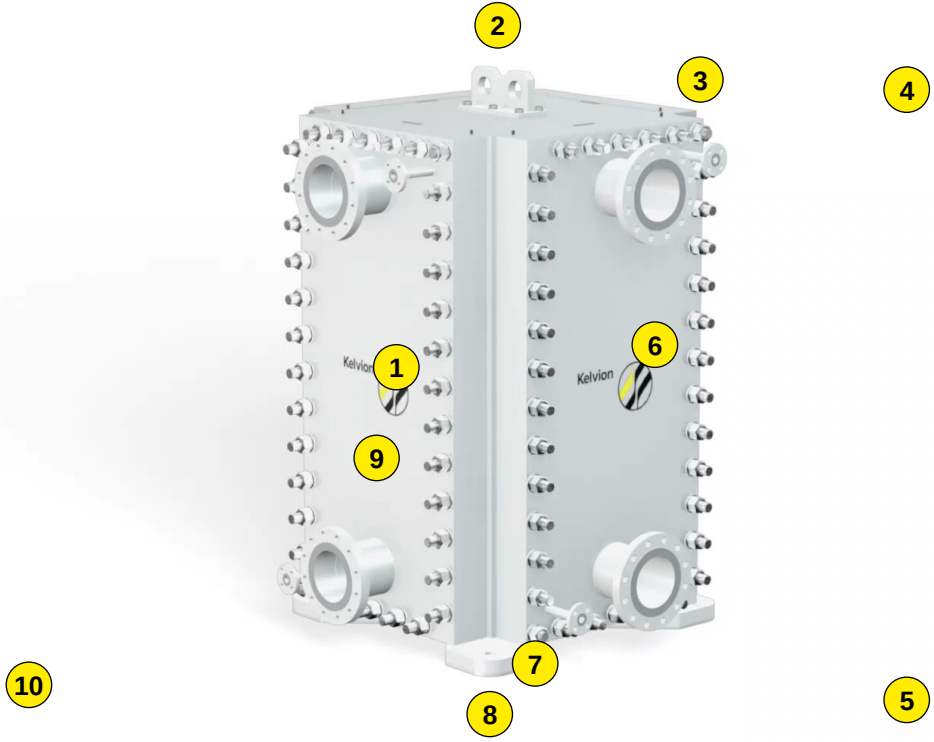
Inspectable design for
high safety requirements

Non elastomeric gaskets
offer a wide resistance range

## Welded Plate Heat Exchanger

# KELVION K°BLOC

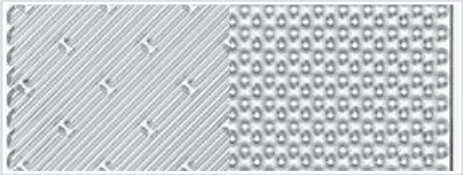
# PRINCIPLE



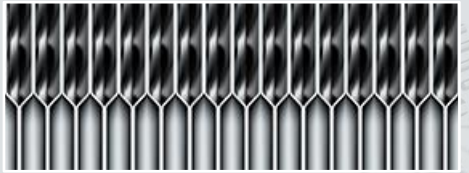

1. Plate pack
2. Top head
3. Panel gasket
4. Panel
5. Primary side connection
6. Column
7. Support
8. Bottom head
9. Baffle
10. Secondary side connection

# MAIN DESIGN ELEMENTS

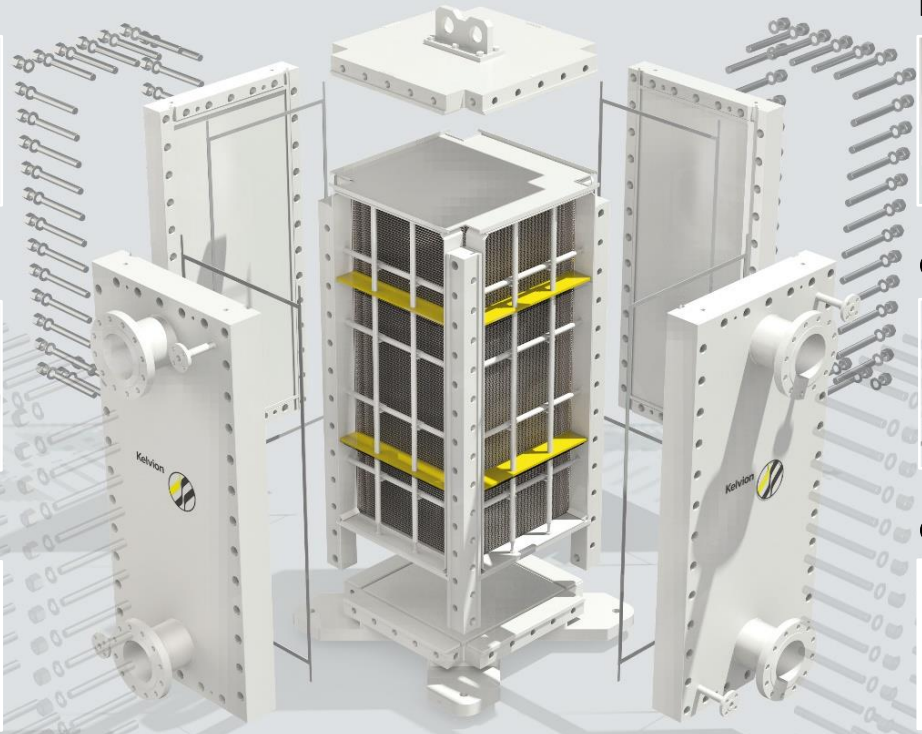
**PLATE CORRUGATIONS**



**COMB**



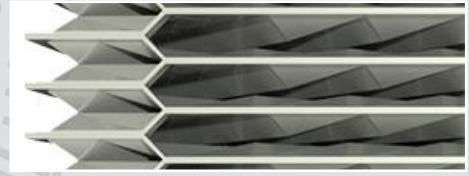
**LINERS**



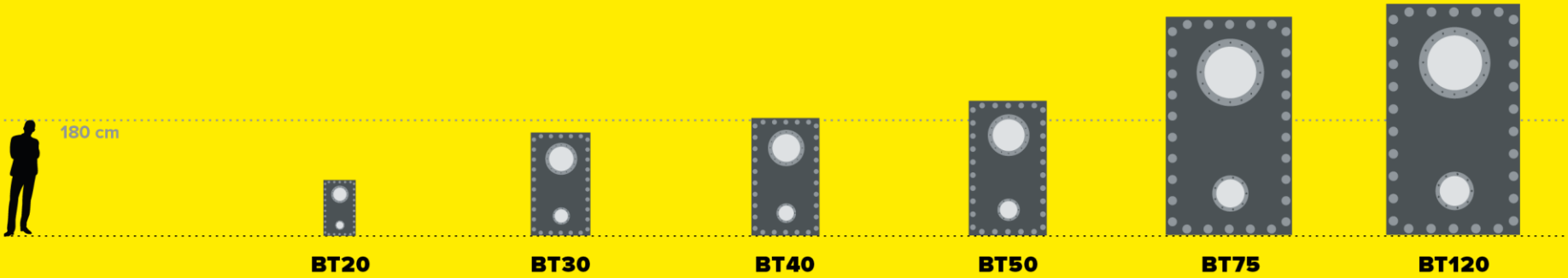

**BAFFLES**

**COLUMN**

**CORNER DESIGN**



# SPECIFICATIONS

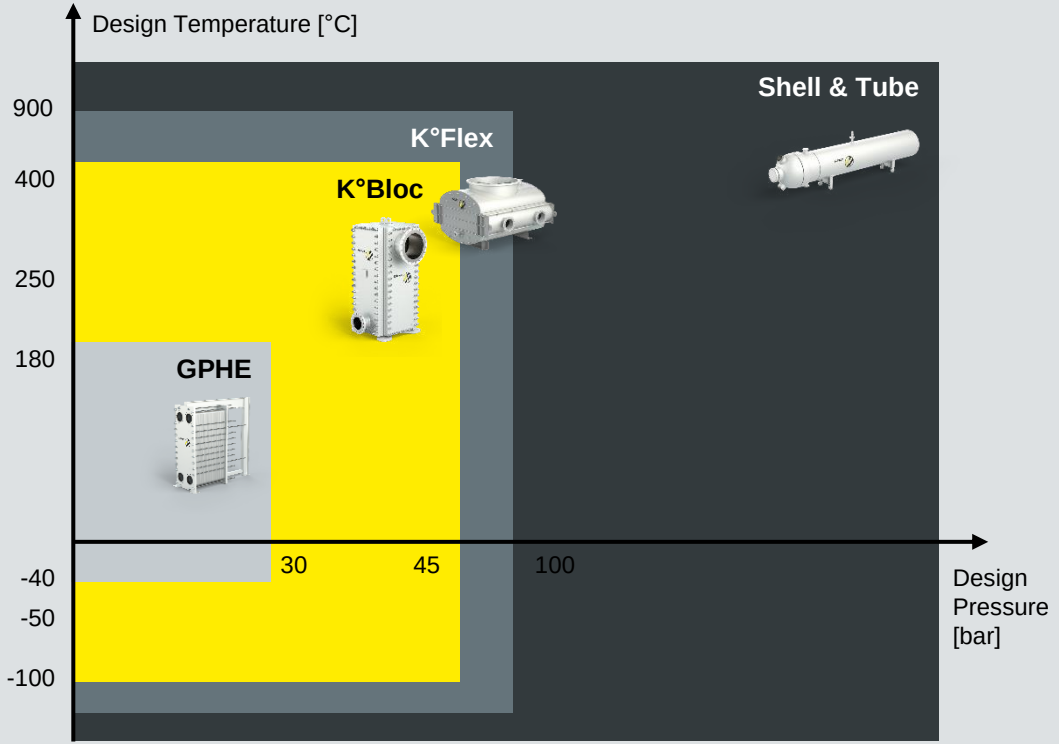



| | BT20 | BT30 | BT40 | BT50 | BT75 | BT120 |
|---|---|---|---|---|---|---|
| SURFACE / PLATE | 0.061 m² | 0.108 m² | 0.164 m² | 0.270 m² | 0.639 m² | 1.720 m² |
| | 0.66 ft² | 1.16 ft² | 1.77 ft² | 2.91 ft² | 6.88 ft² | 18.51 ft² |
| PLATE DIMENSION | 200 x 200 mm | 300 x 300 mm | 400 x 400 mm | 500 x 500 mm | 750 x 750 mm | 1200 x 1200 mm |
| | 7.9 x 7.9 “ | 11.8 x 11.8 “ | 15.7 x 15.7 “ | 19.7 x 19.7 “ | 29.5 x 29.5 “ | 47.2 x 47.2 “ |
| MAX. UNIT HEIGHT | 818 mm | 1643 mm | 1824 mm | 2092 mm | 3386 mm | 3586 mm |
| | 32.2 “ | 64.7 “ | 71.8 “ | 82.4 “ | 133.3 “ | 141.2 “ |
| CONNECTION SIZES | 50 - 150 DN | 50 - 250 DN | 50 - 300 DN | 50 - 400 DN | 80 - 600 DN | 150 - 900 DN |
| | 2 - 6 “ | 2 - 10 “ | 2 - 12 “ | 2 - 16 “ | 3 - 24 “ | 6 - 36 “ |
| MAX. PLATE AMOUNT | 100 | 200 | 240 | 300 | 500 | 500 |

# PRESSURE AND TEMPERATURE

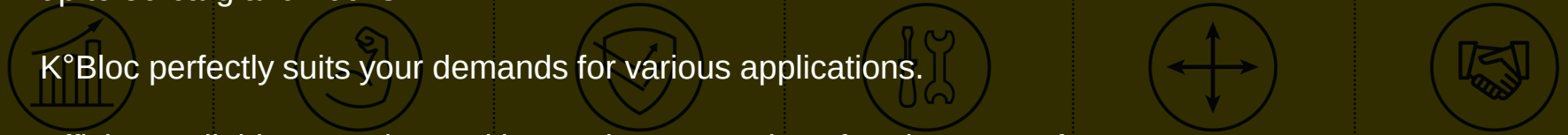
**400°C**
**750°F**

**50 bar**
**725 PSI**

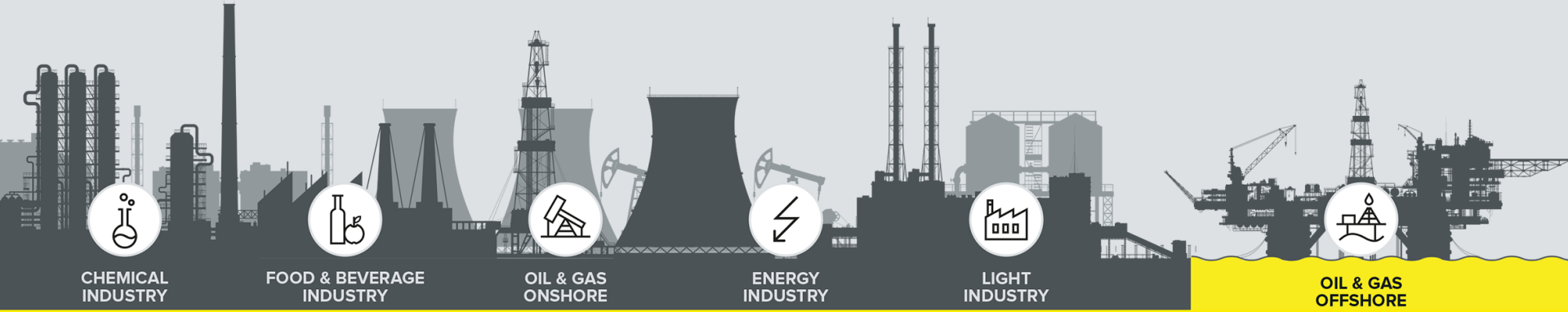


# K°BLOC | RELIABILITY REFINED

- K°Bloc is the result of decades of experience with demanding applications, more than 30 years of welding expertise and a commitment to continuous product improvement.
- Now this fully welded plate heat exchanger has been refined to further enhance its reliability and efficiency. Designed and made in Germany, K°Bloc plays a leading role in Kelvion's package of sustainable solutions, working across a broad range of liquids, temperatures and pressures.
- K°Bloc is available in various materials and 2 different plate corrugations. The unique comb technology and the reinforced corner design makes it suitable for high temperature and pressure process applications up to 50 barg and 400°C.
- K°Bloc perfectly suits your demands for various applications.
- Efficient, reliable operation and low maintenance day after day, year after year.



# K°BLOC | RELIABILITY REFINED




**HIGH EFFICIENCY**

**ROBUST & RELIABLE**

**HIGH CORROSION RESISTANCE**

**LOWER MAINTENANCE**

**FLEXIBLE & COMPACT**

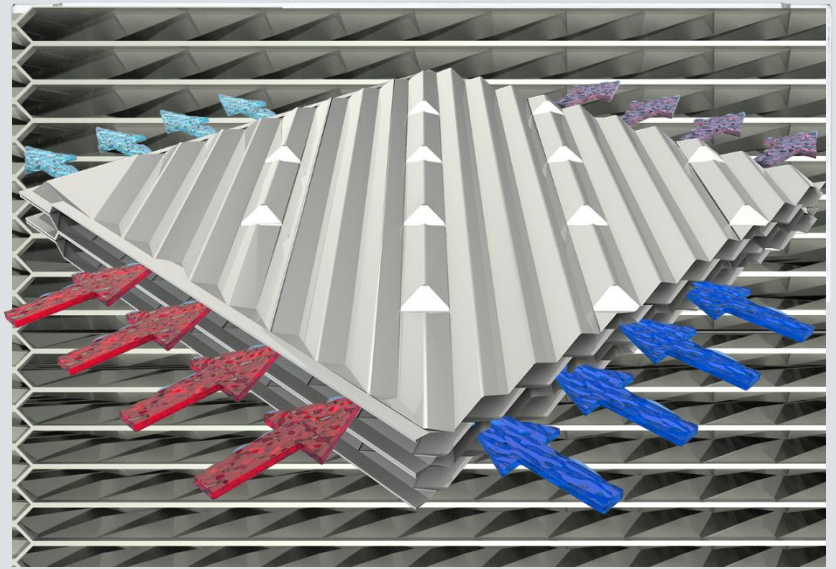
**TRUSTABLE PARTNER**


Kelvion
TURBULENT FLOW
HEAT RECOVERY
DEBOTTLE-NECKING
HEAT TRANSFER
HIGH EFFICIENCY

# TURBULENT FLOW

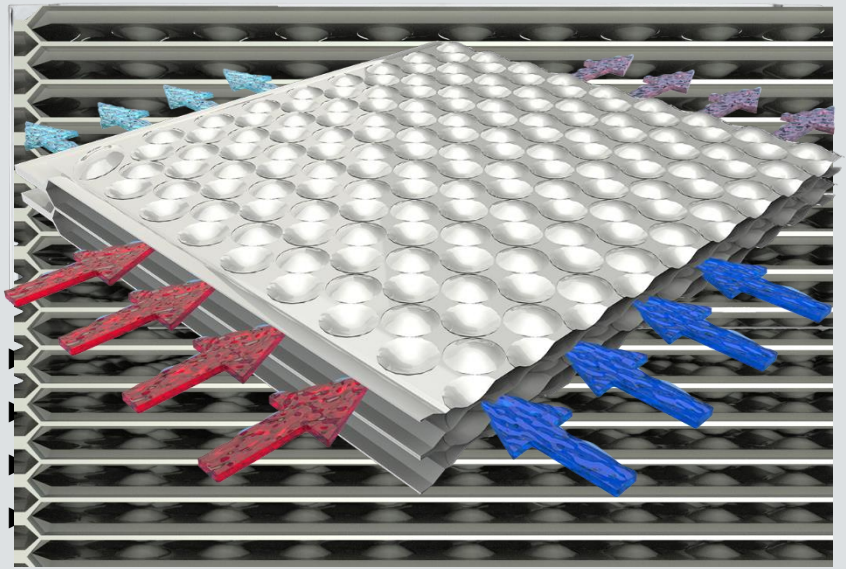
## **CHEVRON** CORRUGATION

Higher Heat Transfer Efficiency



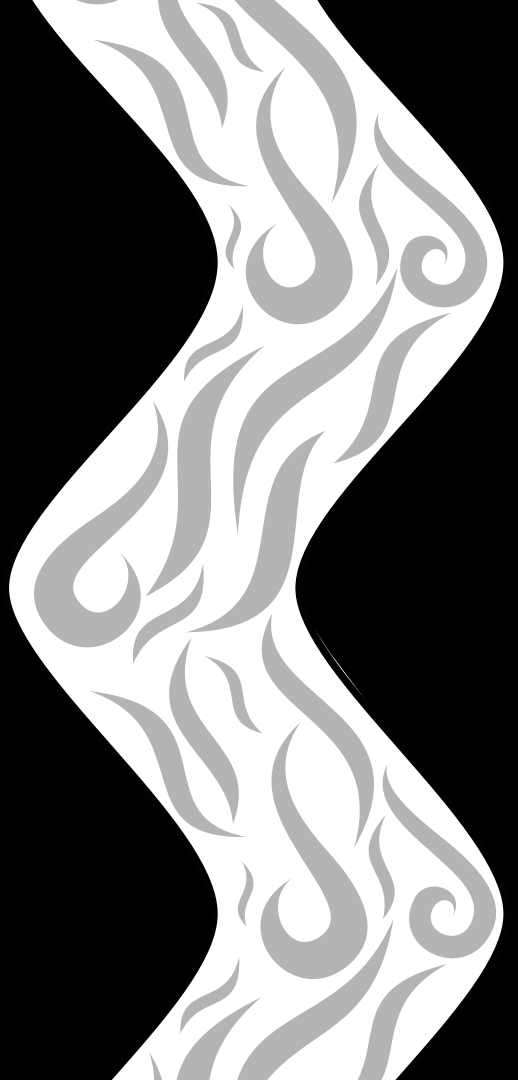
## **DOUBLE DIMPLE** CORRUGATION

Higher Cleanability



# TURBULENT FLOW

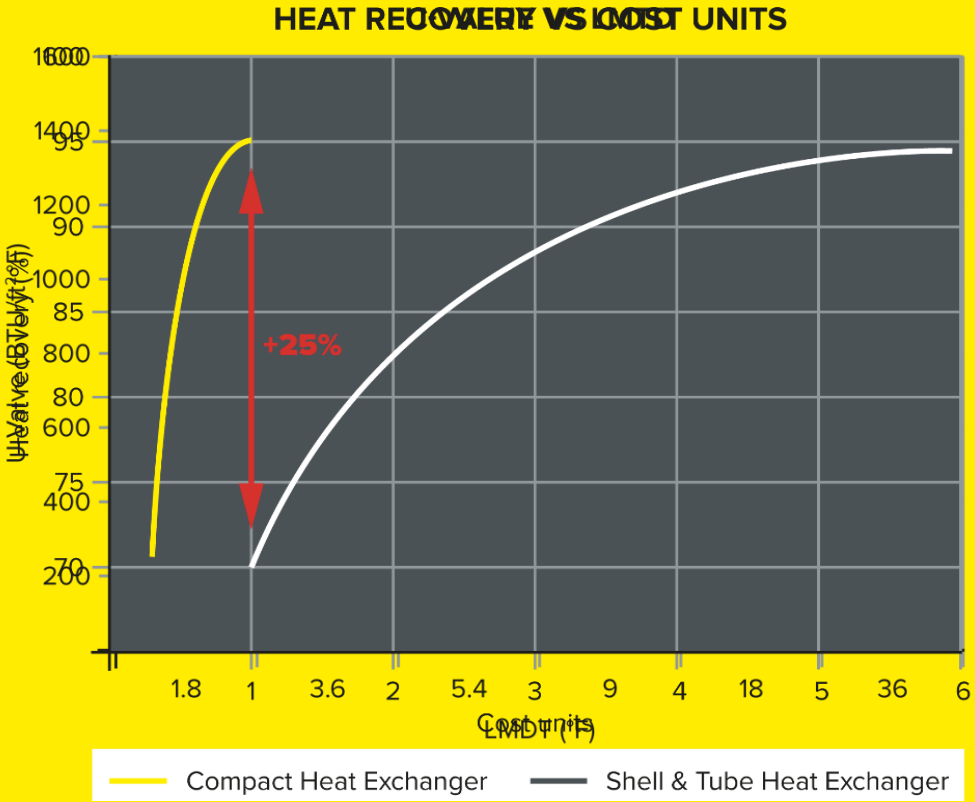
- Higher k-values due to corrugation
- Self cleaning effect → Less fouling, less cleaning
- 5mm channel gap → Turbulent flow also with smaller flow velocities
- High Shear Stress: 3-10 times higher than conventional Shell & Tube Heat Exchangers



**BETTER HEAT TRANSFER**
**DUE TO HIGHER TURBULENCE**

# HEAT RECOVERY LMTD

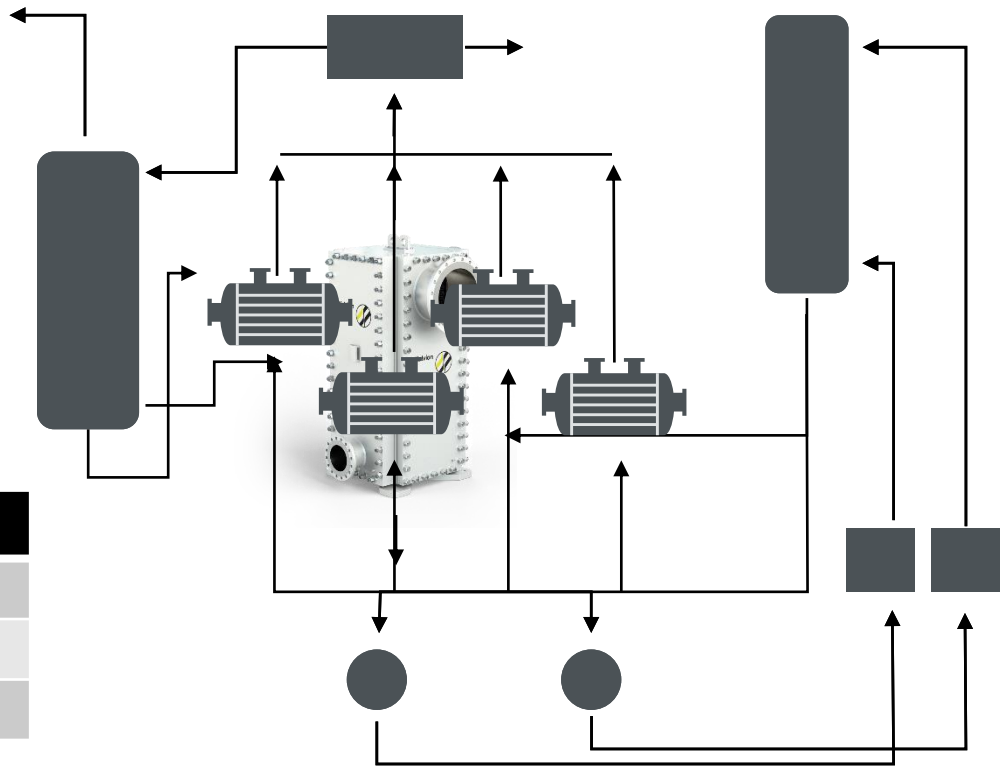
- Need to find a better balance between CAPEX and OPEX
- Improve process heat integration compared with conventional heat transfer technologies
  → high CAPEX & TIC
- Corrugated plate heat exchangers enhancing heat recovery without impacting severely CAPEX
- Higher turbulence allows higher heat transfer coefficients



# DEBOTTLENECKING

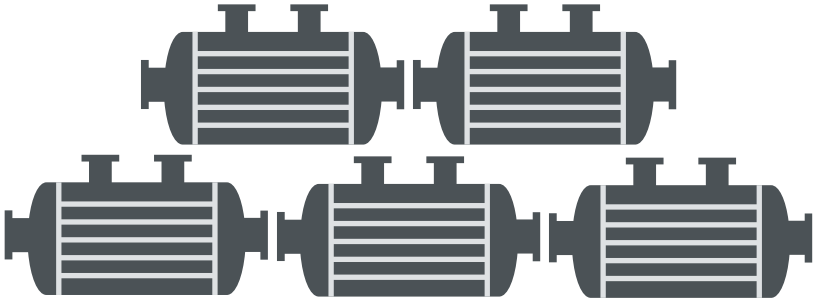
- Capacity expansion project for ammonia plant but limited in gas cleaning section.
- Old set up in the gas cleaning section based on 4 Shell & Tubes + 1 stand-by unit
- Existing set of S&Ts unable to handle higher capacity with same heat recovery
- Process licensor decision to add additional heat exchangers but space constraints
- K°Bloc was unique solution:
  - To handle the additional capacity with limited space requirements
  - To find the best balance between limited CAPEX investment and reduced total install cost (TIC)

| | K°BLOC | SHELL & TUBE |
|---|---|---|
| **Quantity** | **1** | **4+1** |
| **Dimensions [m]** | **2.8 x 1.8 x 1.8** | **5 x 3 x 4** |
| **Empty Weight [kg]** | **35,380** | **70,000** |



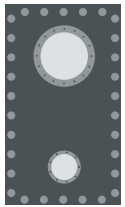
# BETTER HEAT TRANSFER

- New investment on VGO hydrotreating unit
- CAPEX and space constraints for conventional technologies
- High heat integration requirement to reduce energy consumption
- Conventional solution based on 5 S&Ts in series
- K°Bloc was unique solution:
- One K°Bloc able to perform instead of 5 units in series
- Same heat recovery, lower CAPEX and footprint
- Much lower pressure drop requirements for K°Bloc
- Reduce TIC for the new plant



| | SHELL & TUBE | | K°BLOC | |
|---|---|---|---|---|
| | Hot Side | Cold Side | Hot Side | Cold Side |
| Temperature | 371,0 / 266,0 | 247 / 343 | 371,0 / 266,0 | 246,9 / 343,3 |
| Pressure drop [bar] | 0.5 x 5 | 0.5 x 5 | 0.75 | 1.0 |
| Surface total [m²] | 820.6 | | 318.2 | |
| Size [m] | 0.7 x 6.1 (x 5 Pcs.) | | 1.9 x 1.9 | |
| Pcs. | 5 | | 1 | |

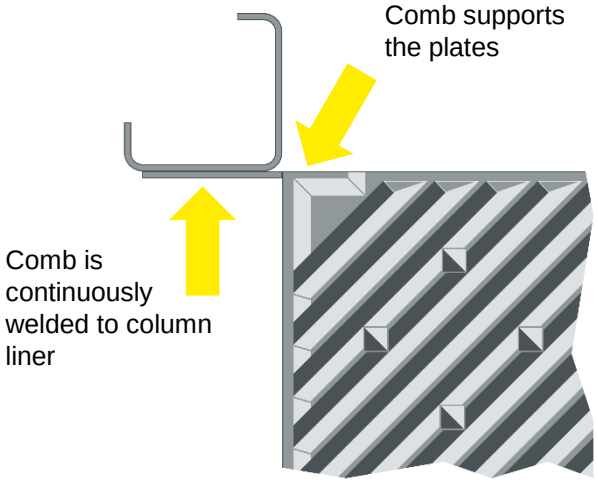
VS




Kelvion
CORNER DESIGN
COMB
LINERS
WELDING & NDE
ROBUST & RELIABLE

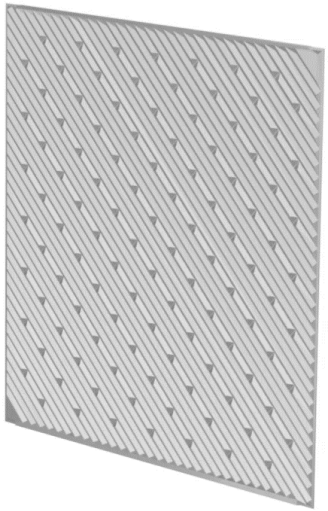
Kelvion

# CORNER DESIGN



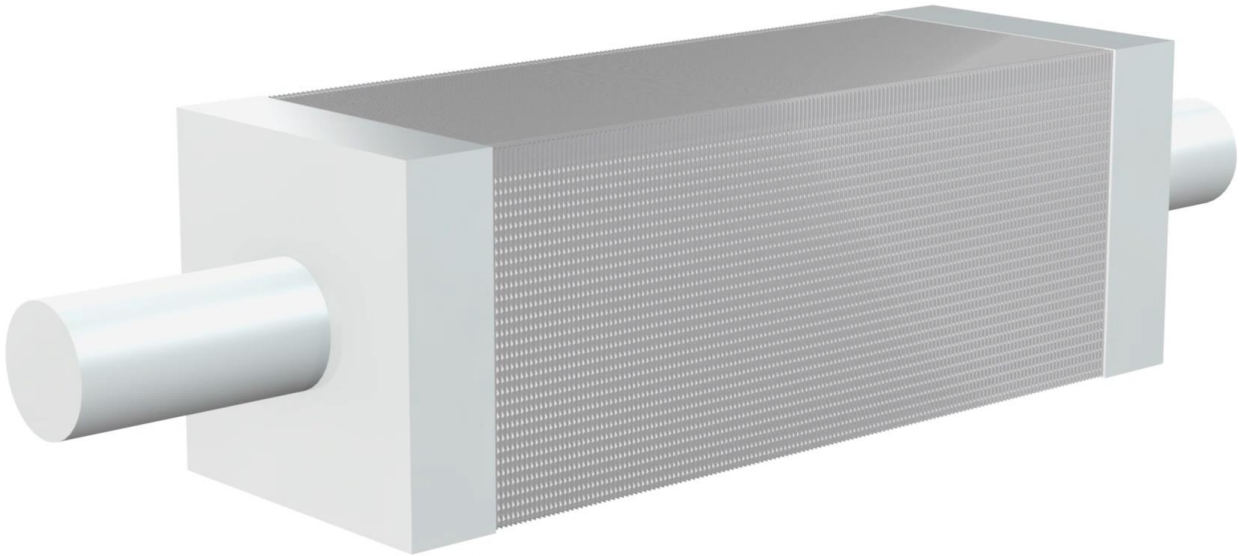

- Strong connection between plate pack and pressure vessel
- Robust Corner design for longer lifetime and reliable operation up to 50 barg

# PRE-COMPRESSION PLATE PACK



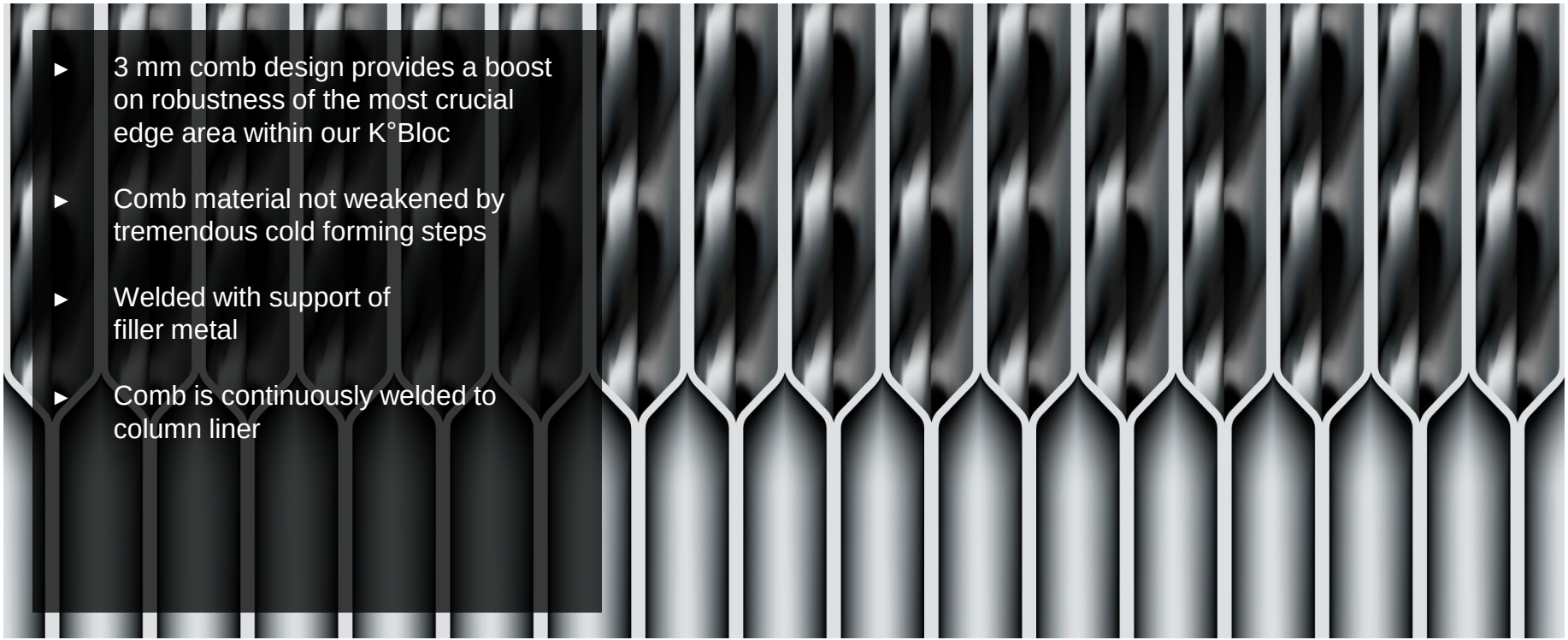
- Under pressure heat transfer plates react elastic and breathing may occur.
- To avoid this, pre-compression of plate pack is required.
- With pre-compression plates are in perfect contact

# COMB



- 3 mm comb design provides a boost on robustness of the most crucial edge area within our K°Bloc
- Comb material not weakened by tremendous cold forming steps
- Welded with support of filler metal
- No crossing welds in critical area.
- Up to 5K/min as temperature change rate ensuring reliable operation for the most critical conditions

# COMB



- 3 mm comb design provides a boost on robustness of the most crucial edge area within our K°Bloc
- Comb material not weakened by tremendous cold forming steps
- Welded with support of filler metal
- Comb is continuously welded to column liner

# COLUMN LINER

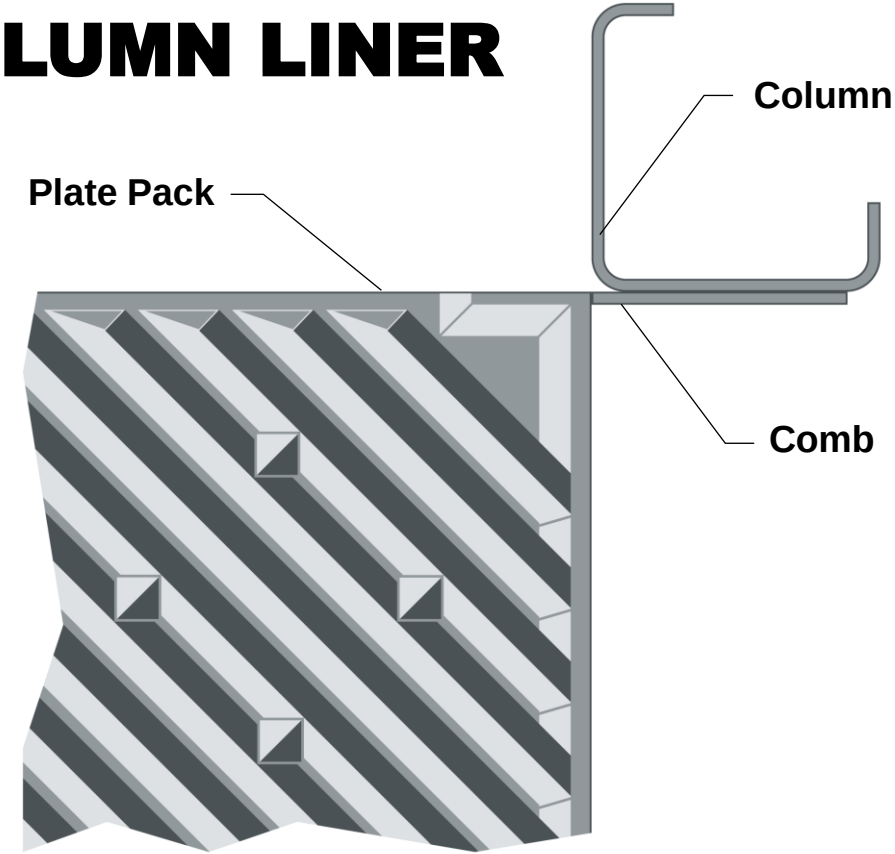
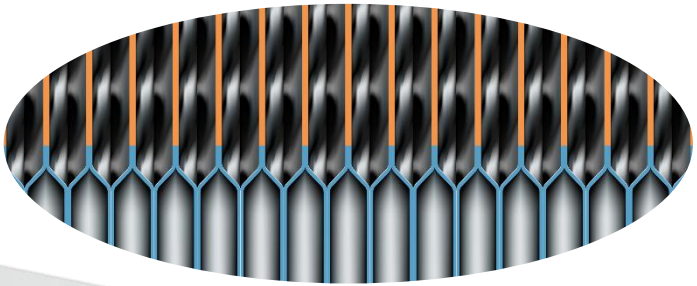



**Plate pack with column liner:**

- One-piece column liner
- 100% metal support:
  Comb supports entire plate pack
- All welds are accessible
- 2 to 3 mm liner thickness for crucial transfer from plate pack forces to pressure bearing vessel
- Better support of sealing surface
- Our one-piece column liner combined with unique K°Bloc comb design offers the highest reliability for most challenging conditions

# WELDING

**AUTOMATIC TIG weld from plate to plate**



**MANUAL TIG weld from plate pack to comb and liners**



**TIG** also known as **GTAW**

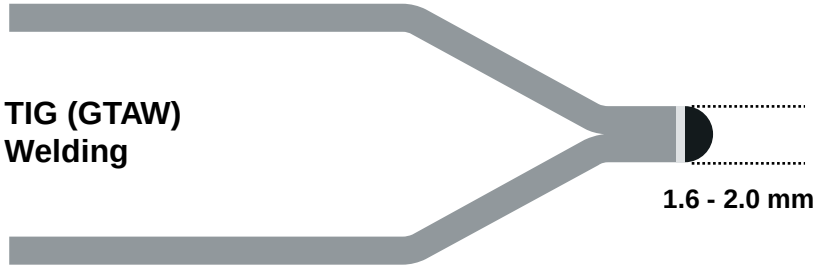
**TIG** = Tungsten Inert Gas (Welding)

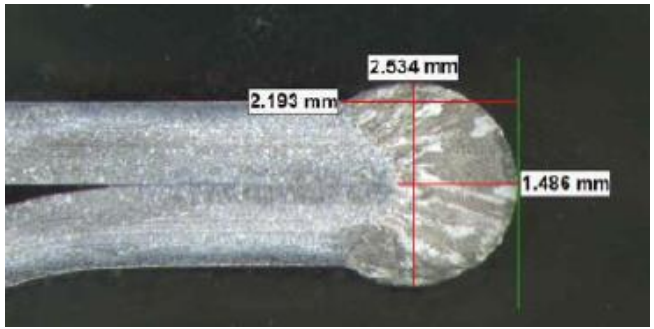
**GTAW** = Gas Tungsten Arc Welding

# WELDING

## ADVANTAGES OF KELVION'S CONSTRUCTION:

- Perfect combination of welding and construction
- Construction and welding allows pre-compression of plate pack
  - The results are metal to metal contact points
  - No movement possible
  - Higher corrosion resistance
- More material at the welding point
  - Allows reparability
  - Allows inspectability (NDE)

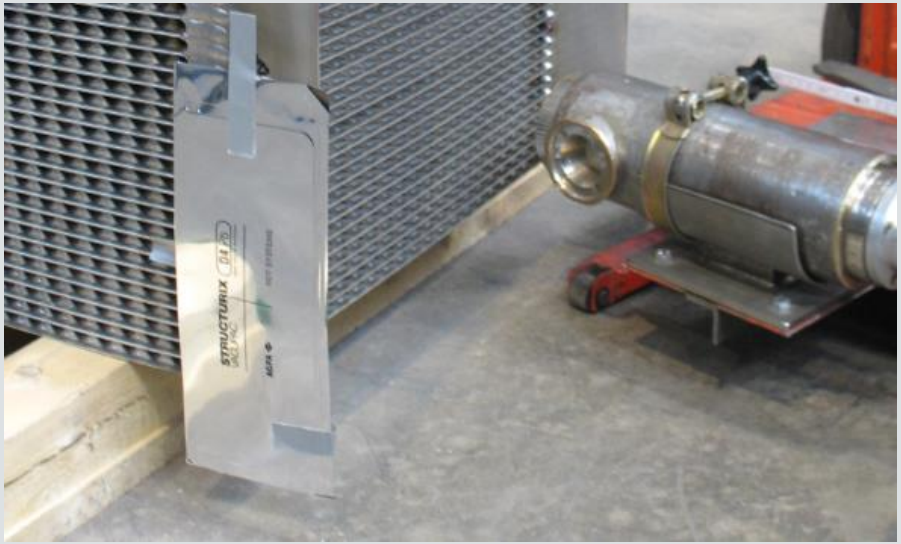



Note: in case of 1.2mm plate, welded thickness is 2.4mm

# X-RAY TESTING (NDE)

- Possibility of X-ray at cassette welding
- X-Ray on pressure vessel set on welds
- Non-Destructive




Kelvion
MATERIALS
WELDING EXPERIENCE
REDUCE CAPEX
CORROSION RESISTANCE

# HEAT RECOVERY FROM OVHDS PREFLASH

- Case example: Western European Refinery
- Addition to a new Preflash column due to feedstock changes (2017 revamp)
- 2 x K°Bloc BT120 | C276 plate material working in parallel
- Customer choice on higher grade material for K°Bloc
- Higher corrosion resistance at lower CAPEX compared to Shell & Tube
- Best balance between low CAPEX, high efficiency and no corrosion risk

| | OVHDS FROM PREFLASH | CRUDE OIL |
|---|---|---|
| **Flow Rate** | 69.250 kg/h (60% condensation) | 780.250 kg/h |
| **Temperature program** | 83°C → 45°C | 24,9°C → 40,4°C |
| **Pressure drop** | ΔP = 0.0126 bar | ΔP = 0.95 bar |
| **Design Condition** | 27,9/FV barg / 0/170°C | 36,3/FV barg / 0/170°C |
| **Heat duty** | 5,292 Gcal/h | |

# MATERIALS

| TYPE | AISI | TRADE NAME | |
|---|---|---|---|
| **1.4306** | 304L | | ✓ |
| **1.4404** | 316L | | ☑ |
| **1.4547** | S31254 | SMO254 | ☑ |
| **1.4539** | 904L | | ✓ |
| **2.4068** | N02201 | Nickel 201 | ✓ |
| **2.4602** | N06022 | Alloy C22 | ✓ |
| **2.4675** | N06200 | Alloy C2000 | ✓ |
| **2.4819** | N10276 | Alloy C276 | ☑ |
| **3.7025** | B265 Gr1 | Titan Gr.1 | ☑ |

**Our K°Bloc is available in various materials for a wide range of different applications**

☑ Standard Plate Materials

✓ Further Plate Materials

Other materials are available upon request

# WELDING EXPERIENCE

- 3 decades of welding expertise on all special alloys ensure a long lifetime
- Sustainable, high quality welds
- TIG (GTAW) Welding
  - Just one welding process for complete plate bundle
  - State of the art technology
  - Process controlled and reliable
  - Available all over the world
- Automized plate welding

# CAPEX REDUCTION

**APPROXIMATELY 2.5 x LESS CAPEX FOR K°BLOC**

- Heat integration project
- Due to corrosion, material upgrading required
- Solution based on conventional S&Ts not able to fulfil a good return on investment
- Requirement on tube material upgrading to DUPLEX → too high CAPEX for S&Ts
- K°Bloc was unique solution:
  - To handle the additional required heat recovery with limited space
  - Reduce CAPEX and TIC and match material requirement (SMO254 plates)

| | ATMOSPHERIC RESIDUE | CRUDE OIL |
|---|---|---|
| **Flow Rate** | 363.900 kg/h | 651.200 kg/h |
| **Temperature program** | 355,5°C → 263,5°C | 213,5°C → 267,5°C |
| **Pressure drop** | ΔP = 1,71 bar | ΔP = 1,63 bar |
| **Design Condition** | 21,5/FV barg / 0/383°C | 28,9/FV barg / 0/285°C |
| **Heat duty** | 22,27 Gcal/h | |


Kelvion
REPAIR-
ABILITY
CLEANING
REDUCE
FOULING
KELVION
SERVICE
LOWER MAINTENANCE

# LOWER MAINTENANCE

## FOULING REDUCTION

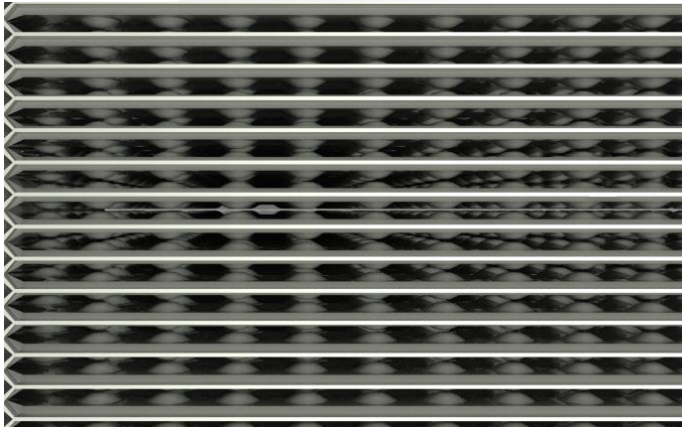
- K°Bloc patterns boost turbulence (longer uptime)
- K°Bloc Double Dimple able to handle higher solid content
- Turbulent Flow maximises shear stress (reduce fouling rates)

## CLEANING

- Mechanical Cleaning by hydroblasting (removable covers)
- Chemical Cleaning (CIP): Less cleaning agent because of smaller volume
- Minimum space needed for dismantling
- Double Dimple provides high cleanability for the toughest fouling media

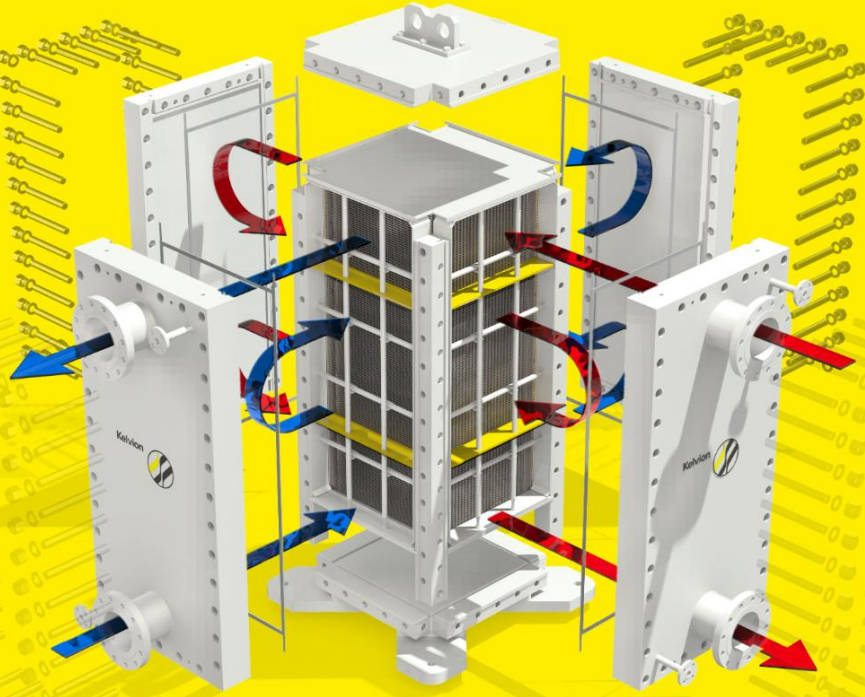
## INSPECTION

- Fully inspectable
- All welds accessible
- Baffles removable



# REPAIRABILITY

- Repair possibility of comb welds, plate welds, liner welds and blocking channels in case of cracked plates by TIG due to direct access
- All channels accessable for cleaning and inspection purposes
- Changing of process parameters possible due to on site adjustment (Baffle location)
- All welds accessible and all marked parts repairable



# CLEANING

# GLOBAL SERVICE NETWORK

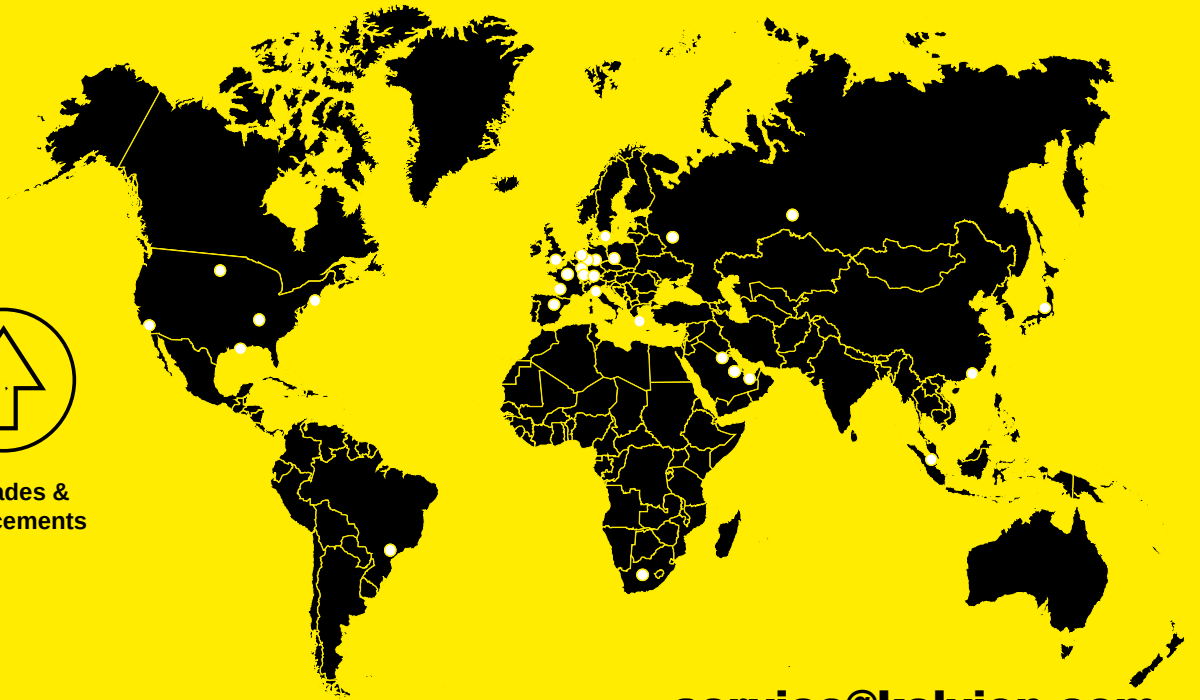
Start-Up Services & Onsite Services

Repairs, Overhauls & Maintenance

Spare Parts & Spare Part Solutions

Monitoring, Consulting & Training

Upgrades & Replacements



## ALL BRAND SERVICES

## PERFORMANCE AGREEMENTS

service@kelvion.com
www.kelvion.com/service


Kelvion
LOW FOOTPRINT
BAFFLES
APPLICATION VERSATILITY
HEAT RECOVERY
FLEXIBLE & COMPACT

# SPECIFICATIONS


| | | | | | | |
|---|---|---|---|---|---|---|
| MAX. UNIT HEIGHT | 818 mm | 1643 mm | 1824 mm | 2092 mm | 3386 mm | 3586 mm |
| | 32.2 “ | 64.7 “ | 71.8 “ | 82.4 “ | 133.3 “ | 141.2 “ |
| CONNECTION SIZES | 50 - 150 DN | 50 - 250 DN | 50 - 300 DN | 50 - 400 DN | 80 - 600 DN | 150 - 900 DN |
| | 2 - 6 “ | 2 - 10 “ | 2 - 12 “ | 2 - 16 “ | 3 - 24 “ | 6 - 36 “ |
| MAX. PLATE AMOUNT | 100 | 200 | 240 | 300 | 500 | 500 |

# BAFFLES

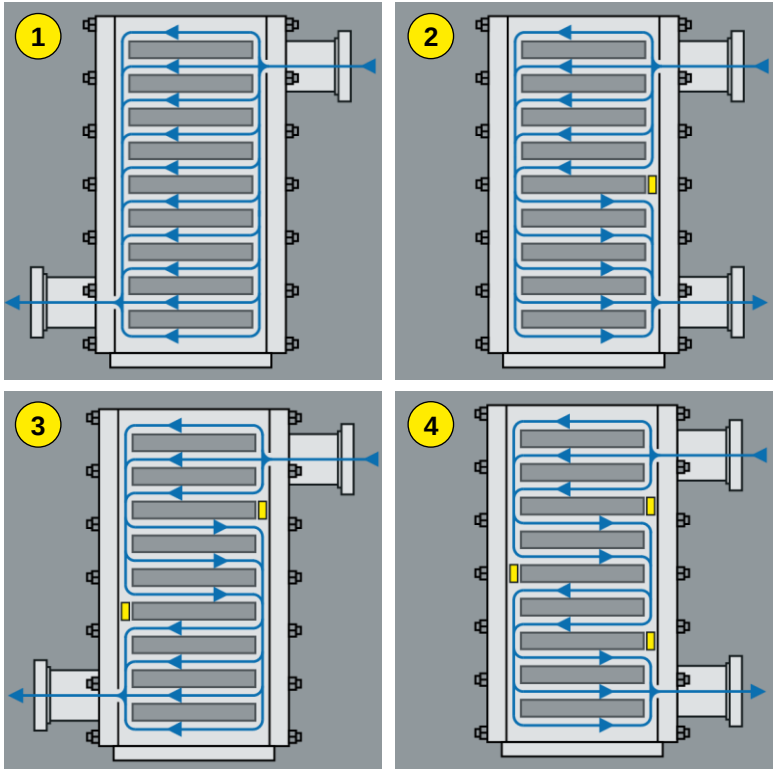
## WHY IS A BAFFLE REQUIRED?

Baffles allow multi pass designs for thermal plate length extension

## FUNCTION AND FACTS

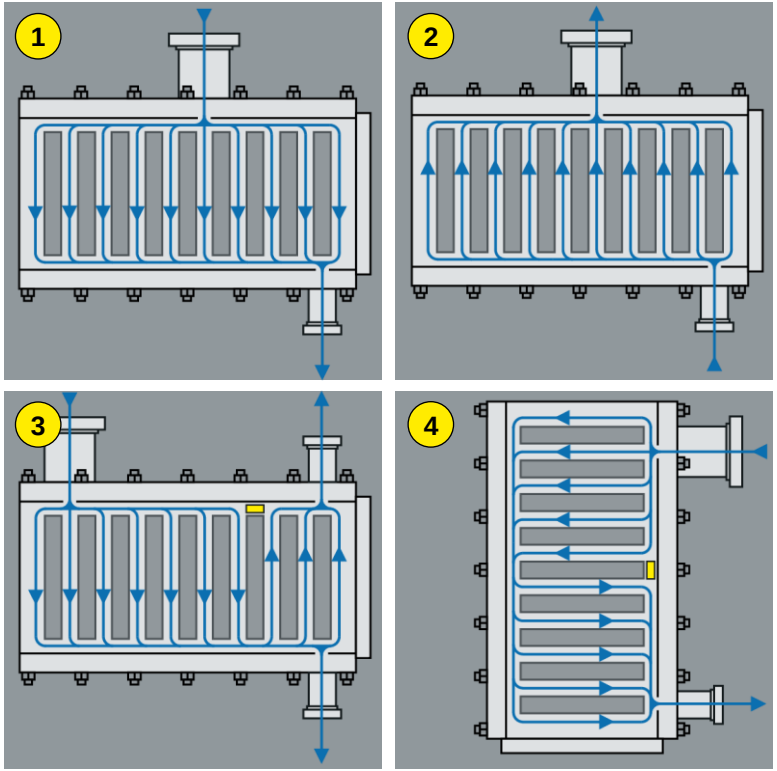
- Odd pass designs have inlet connection on one panel and the outlet connection on opposite panel
- Even pass designs have inlet and outlet connections on one panel
- Pass configuration allows dealing with non symmetrical flows

# BAFFLES




1. 1-Pass
2. 2-Pass
3. 3-Pass
4. 4-Pass

# BAFFLES




1. **Horizontal**
   for Condensation
2. **Horizontal**
   for Evaporation
3. **Horizontal (2 Outlets)**
   for separation or condensation with inert gas.
4. **Vertical**
   for Liquid-Liquid and Multipass Condensers and Evaporators

# APPLICATION VERSATILITY

### OIL & GAS

- Gas Dehydration
- Gas Sweetening
- Crude Oil Stabilization
- Crude Oil Desalting
- Crude Oil Dehydration
- Gas Fractionation
- NGL Recovery

### CHEMICALS

- Olefins (Ethylene, EO-EG)
- Aromatics
- Sodium Hydroxide (NaOH)
- Polymers
- Caustic Evaporation
- Methanol
- Chlorine

### OTHER

- Pulp and Paper
- Urea
- Ammonia
- Nitric Acid
- Phenol
- Bitumen

### REFINERY

- Crude Oil Preheating (CDU)
- Gas Sweetening
- LPG Recovery
- Fluid Catalytic Cracking
- Hydro Conversion Processes
- Sour Water Stripping
- Desalter
- Alkylation
- Isomeritation

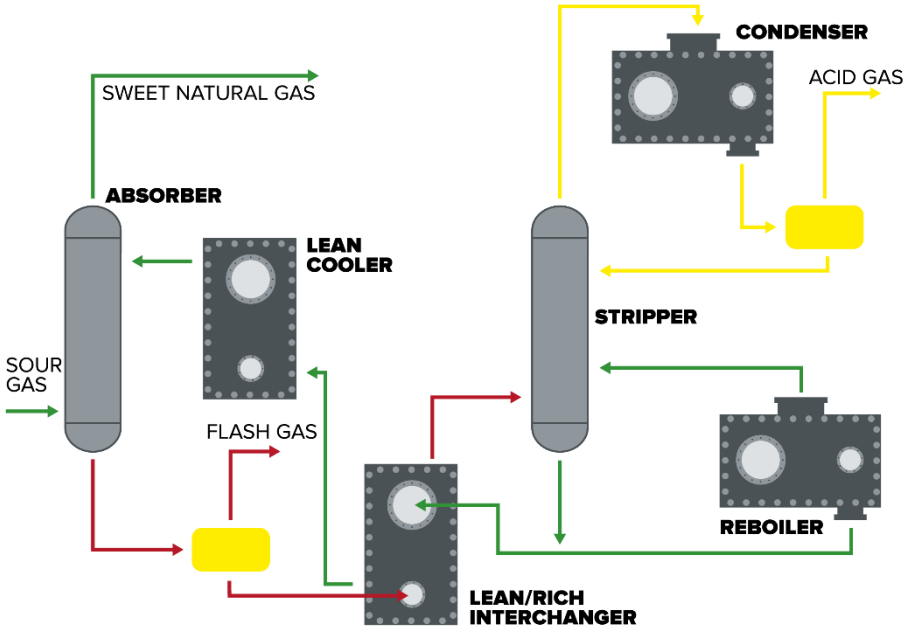
### AGRICULTURAL NATURAL RESOURCES

- Refining
- Biodiesel
- Bioethanol
- Bio Refineries
- Deodorization

# MEDIA VERSATILITY

- Fresh Water
- Sea Water
- Sulfuric Acid
- Lean/Rich TEG
- Rendered Animal Fat
- Brine
- Sodium Hydroxide
- Ethanol
- Biodiesel
- Lean/Rich Amine
- Glycol Blends
- Ammonia/Water Blends
- Steam
- Crude Oil

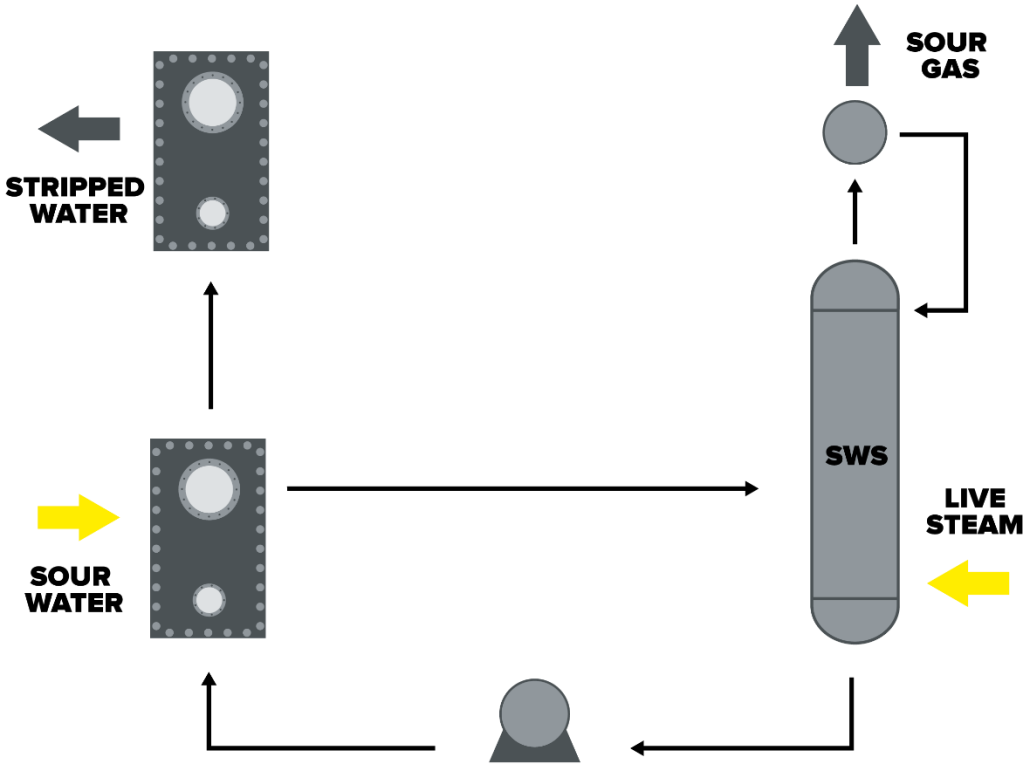
# REBOILER




Gas Sweetening Process with K°Bloc

| | K°Bloc Reboiler | Shell & Tube Reboiler |
|---|---|---|
| **Operating temperature** | Limited to about 650˚F | Unlimited |
| **Operating pressure** | Limited to about 500 psig | Unlimited |
| **Fouling tendency** | Low | Moderate to high |
| **Capital cost** | Low | High |
| **Advantages** | ► More compact<br>► Lower CAPEX and OPEX<br>► High heat transfer coefficients (2 – 4 times STHE designs)<br>► Lower fouling<br>► Fluid residence time is very short, less solvent degradation<br>► Short flow path, smaller height to drive the flow<br>► Closer temperature approach allows lower pressure steam<br>► Better energy efficiency | ► Design flexibility (kettle, E-shell etc.)<br>► Ability to separate flow<br>► Higher flexibility in steam operating conditions (higher pressure possible)<br>► Well-known, familiar technology |
| **Disadvantages** | ► Limited operating conditions (temperature, pressure)<br>► Sensitive to changes in operating conditions<br>► Not suitable for very low vacuum services, pressure drop issue | ► Higher capital and operating costs<br>► Power and maintenance<br>► Typically constructed of carbon steel, leading to corrosion |

# SOUR WATER STRIPPER




## MATERIALS AND CONSTRUCTION

**Heat Transfer Plate:**
- 316L Stainless
- SMO 254
- Nickel and Nickel alloys
- Titanium, and others on request

**Other Media-Contacting Parts:**
All other media-contacting parts are made from high-grade alloys, according to the application.

**Port Connection:**
Raised Face Welded Neck Flange as standard.
Others available on request.

**Pressure Plate:**
SA516 Grade 60 or 70, depending on code.

## PERFORMANCE

**Design Pressure:**
Maximum standard design pressure is 500 psig (35 barg).
Higher pressures are available on request.

**Design Temperature:**
Maximum standard design temperature is 662°F (350°C).
Minimum standard design temperature is -20°F (-28°C).
Higher temperatures are available on request.

Kelvion

# ENHANCED HEAT RECOVERY

## EASTERN EUROPEAN REFINERY

**165 000 bpd (8.1 mtpa) /**
**Russian and alternative crude oil processing**

Crude distillation unit revamp
Improved process heat integration
Avoid corrosion risk
**1 K°Bloc BT75 C276 plate material**

| Overhead vapor from CDU | Crude Oil |
|---|---|
| 40252 kg/h (full condensation) | 262446 kg/h |
| 132.39°C -> 40°C | 14.33°C -> 54.66°C |
| ΔP = 0.02 bar | ΔP = 0.11 bar |
| Design Condition<br>1 barg / -20/170°C | Design Condition<br>30 barg / -20/170°C |
| 5.65 MW | |


Kelvion
MADE IN GERMANY
100 YEARS EXPERIENCE
GLOBAL BUT LOCAL
TRUSTABLE PARTNER

# DESIGNED AND MADE IN GERMANY

Your global partner providing all industries with trusted **Plate Heat Exchanger Technology** and Service where Expertise is needed.

**RELIABLE. SUSTAINABLE. EFFICIENT.**


# WELDING EXPERIENCE

**Aquired 2002**

**Balcke-Dürr GmbH**
Developing and manufacturing **since 1986** welded plate heat exchanger for industrial applications.

**Aquired 2008**

**ViEX Inc.**
Developing and manufacturing **since 2000** welded plate heat exchanger for industrial applications.

**GEA Ecoflex GmbH**
Developing and manufacturing **since 2002** welded plate heat exchanger for industrial applications **in Sarstedt, Germany**

**Kelvion PHE GmbH**
**Since 2011** Center of Competence with today 98 employees responsible for welded plate heat exchangers, **located in Sarstedt, Germany**

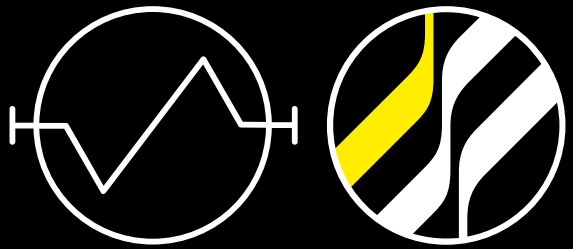
**MORE THAN 3 DECADES OF WELDING EXPERIENCE**


**2020**
**K°BLOC**
**RELIABILITY REFINED**

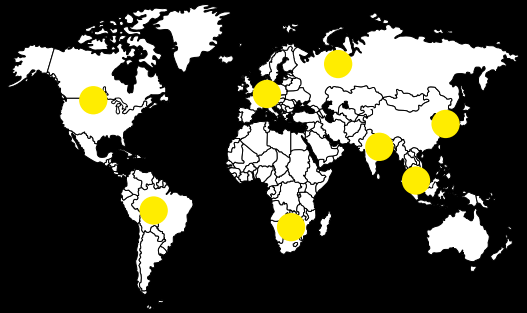

YEARS OF
EXPERTISE
100
EMBRACE OUR PAST.
BUILD OUR FUTURE.

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

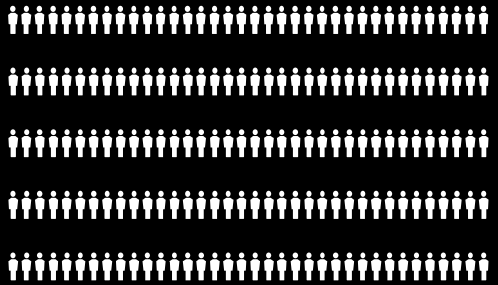
## OUR LOGO – INSPIRED FROM THE SCHEMATIC FOR HEAT EXCHANGER



## 67 BRANCHES AND SALES PARTNERS WORLDWIDE



## 5,000 EMPLOYEES – WORLDWIDE



## YOUR MARKETS ARE OUR MARKETS


## KELVION HAS A LONG HISTORY

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

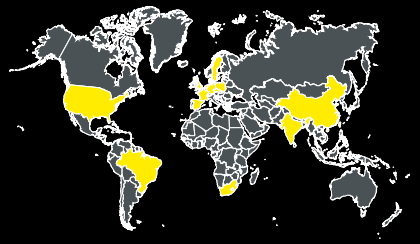
**2014** GEA sells the Heat Exchangers Segment to Triton.

**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)

# OUR MANUFACTURING CAPABILITIES



## GERMANY
**Herne** (MCS)
- Closed Circuit Coolers
- Engine Air & Gas Coolers

**Monzingen** (MCS)
- Aluminium Blocs
- Shell & Tube Double Safety
- Shell & Tube Single
- Transformer Oil Air Cooler
- Transformer Oil Water Coolers & Pumps

**Nobitz-Wilchwitz** (PHE)
- Brazed Plate Heat Exchangers

**Sarstedt** (PHE)
- Fully Welded Plate Heat Exchangers
- Gasketed Plate Heat Exchangers

## CZECH REPUBLIC
**Nymburk** (RT)
- Commercial Air Coolers
- Customized Air Coolers

## FRANCE
**Wingles** (RT)
- Cooling Towers
- Dry Coolers
- Radiators
- Shell & Tube Single
- Transformer Oil Air Cooler

**Nantes** (PES)
- Air Cooled Condensers
- Air Fin Coolers Alu
- Diffusion Bonded Heat Exchangers

## POLAND
**Opole** (PES)
- Air Dryers & Economizers
- Air Fin Coolers Alu
- Air Fin Coolers HDG
- Desublimators
- Fully Welded Plate Heat Exchangers
- Shell & Tube Process
- Shell & Tube Single
- Transformer Oil Air Cooler

**Świebodzice** (RT)
- Coils
- Commercial Air Coolers
- Condensers
- Dry Coolers
- Engine Air & Gas Coolers
- Radiators

## SWEDEN
**Ystad** (PHE)
- Gasketed Plate Heat Exchangers

## NETHERLANDS
**Almere** (MCS)
- Engine Air & Gas Coolers
- Shell & Tube Double Safety
- Shell & Tube Single

**Doetinchem** (PES)
- Closed-Loop Cooling Towers
- Modular Cooling Towers

**Sint Maartensdijk** (RT)
- Customized Air Coolers

## SPAIN
**Igorre** (PES)
- Air Dryers & Economizers
- Air Fin Coolers Alu
- Air Fin Coolers HDG
- Shell & Tube Process
- Shell & Tube Steam

## UNITED KINGDOM
**Fareham** (RT)
- Commercial Air Coolers
- Condensers
- Customized Air Coolers
- Dry Coolers
- Radiators

## SOUTH AFRICA
**Germiston** (PES) *[Service Factory]*
- Air Fin Coolers
- Cooling Towers
- Field-Erected Mechanical Draft
- Petrochemical Systems

## CHINA
**Wuhu** (MCS)
- Air Dryers & Economizers
- Brazed Plate Heat Exchangers
- Gasketed Plate Heat Exchangers
- Closed Circuit Coolers
- Commercial Air Coolers
- Dry Coolers
- Engine Air & Gas Coolers
- Radiators
- Shell & Tube Double Safety
- Transformer Oil Air Cooler
- Transformer Oil Water Coolers & Pumps

**Changshu** (PES)
- Air Cooled Condensers
- Air Fin Coolers Alu
- Shell & Tube Steam

## INDIA
**Pune** (PHE)
- Air Cooled Condensers
- Air Dryers & Economizers
- Air Fin Coolers Alu
- Aluminium Blocs
- Closed Circuit Coolers
- Desublimators
- Fully Welded Plate Heat Exchangers
- Gasketed Plate Heat Exchangers
- Radiators
- Shell & Tube Steam

## QATAR
**Doha** (PES) *[Service Factory]*
- Air Cooled Condensers
- Air Fin Coolers
- Shell & Tube

## UNITED STATES
**Catoosa** (PES)
- Air Dryers & Economizers
- Air Fin Coolers Alu
- Brazed Plate Heat Exchangers
- Gasketed Plate Heat Exchangers

**Knoxville** (RT)
- Dry Coolers

**Burkesville** (MCS) *[Rocore]*
- Shell & Tube Single

**Franklin** (MCS) *[Rocore]*
- Aluminium Blocs
- Closed Circuit Coolers

## BRAZIL
**Franco da Rocha** (PES)
- Air Dryers & Economizers
- Air Fin Coolers Alu
- Closed Circuit Coolers
- Gasketed Plate Heat Exchangers
- Shell & Tube Process
- Shell & Tube Steam

# YOUR MARKETS ARE OUR MARKETS

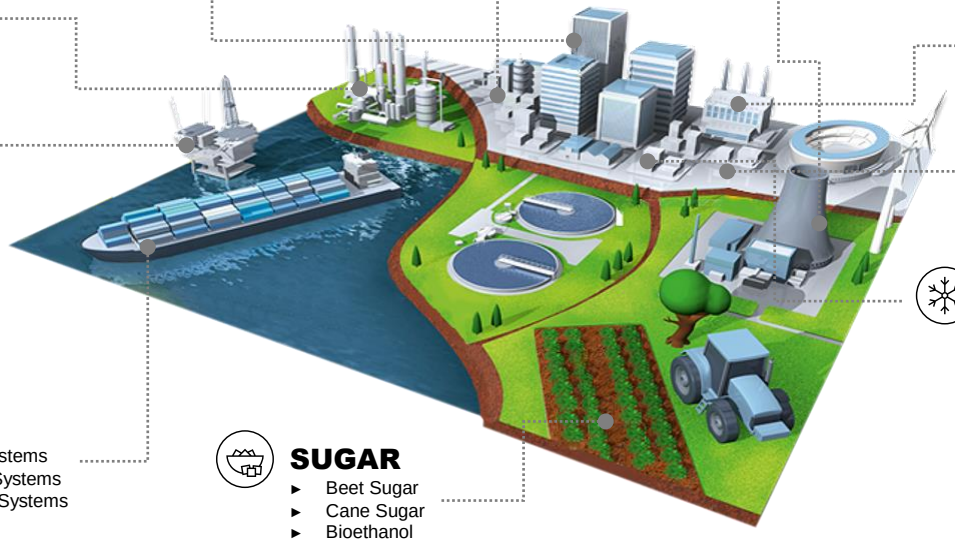
## CHEMICALS
- Basic Chemicals
- Agrochemicals
- Petrochemicals
- Polymers & Plastics
- Pharmaceuticals & Fine Chemicals
- Specialty Chemicals

## HVAC
- District Heating & Cooling
- Air Conditioning
- Potable Water & Swimming Pools
- Renewable Energy

## FOOD & BEVERAGE
- Dairy
- Brewery
- Beverages
- Viscous foods & Edible oils

## POWER
- Diesel & Gas Engines
- Fossil Power Plants
- Grid
- Renewable Energies
- Steam & Gas Turbines

## TRANSPORTATION
- Diesel Rail
- Electric Rail
- Heavy Duty Vehicles



## HEAVY INDUSTRY
- Steel Production / Metallurgy
- Cement Industry
- Automotive Plants
- Industrial Effluents
- Industrial Waste Water
- Waste Incineration
- Surface Treatment
- Tires Industry
- Mining

## OIL & GAS
- Drilling
- Oil & Gas Production
- Oil & Gas Transportation
- Crude Oil Refining
- Petrochemicals

## REFRIGERATION
- Fruit & Vegetable Storages
- Data Centers
- Display Cases & Bar Counters
- Supermarkets
- General Food Processing
- Meat Processing
- Leisure & Test Facilities
- Marine Sector
- Distribution Centers
- Agricultural Greenhouses

## MARINE
- Exhaust Systems
- On-Board Systems
- Propulsion Systems

## SUGAR
- Beet Sugar
- Cane Sugar
- Bioethanol

Kelvion

# CONTACT

www.kelvion.com

Kelvion

# OUR VISION

# HEAT X-CHANGING THE WORLD WITH SUSTAINABLE ENGINEERED SOLUTIONS