Lowering operational cost and optimizes the productivity of your plant with the right heat exchanger

19th November 2020

1. Save cost of ownership and boost heat recovery by Spiral Heat Exchanger
2. Minimise CAPEX cost while maintaining efficiency using Compabloc Heat Exchanger
3. Robust solution in cyclic process conditions with Duroshell Heat Exchanger

Our speakers

Choy Weng Kean received his degree in Chemical Engineering from University of Malaya. He is responsible in refinery and oleochemical industries in Malaysia and Singapore

Eser Aydin holds Mechanical Engineering Degree from University of Kocaeli. His work in Alfa Laval is focused on global sales for ethanol, sugar, starch, biodiesel and vegetable oil industries

Save cost of ownership and boost heat recovery in Spiral Heat Exchanger

Choy Weng Kean
Sales Manager – Edible Oil Thermal & Separation

Refining challenges on heat recovery exchanger

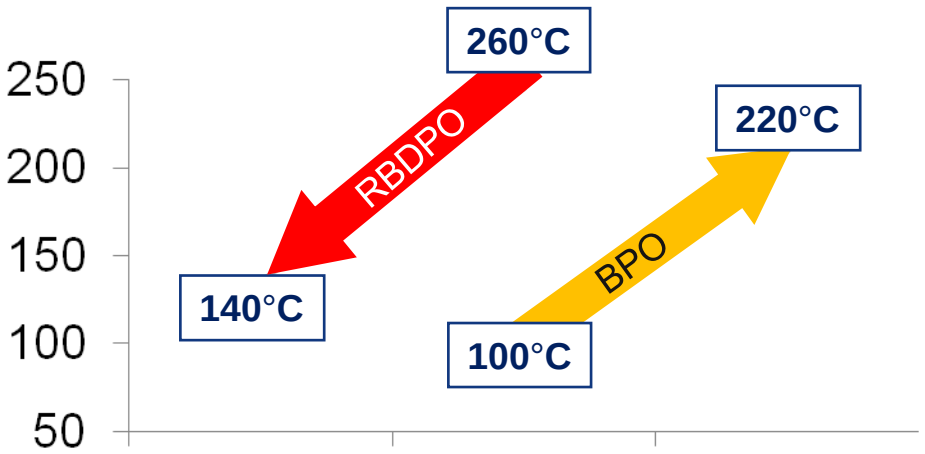
− Challenges faced nowadays by refiners

- Low heat recovery, high fuel cost making business unprofitable
- Reduced heat efficiency and production flow rate due to fouling issue
- Leaking in heat exchanger causing down time

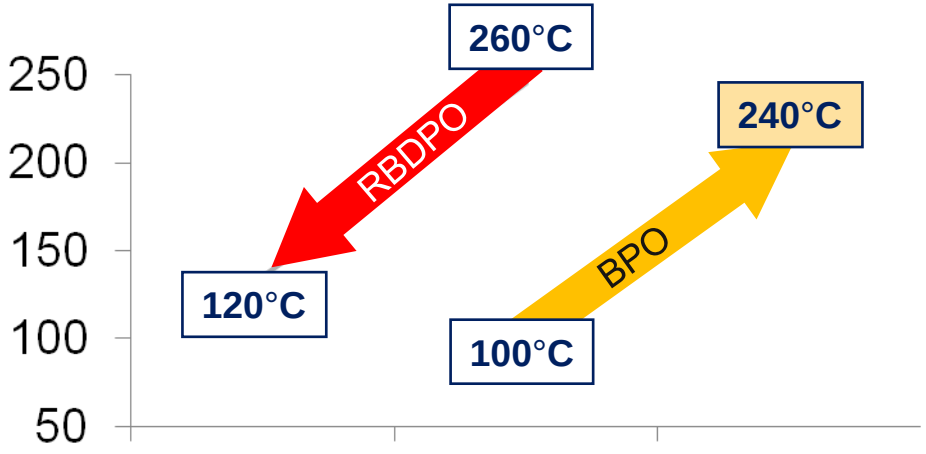
Heat Recovery in Deodorization process

– RBDPO-BPO heat recovery profile

Typical heat recovery in deodorization ~75%



Improved heat recovery up to 85%



Improve heat recovery with Alfa Laval Heat Recovery Plus+

– 2-stage heat recovery with lower capital cost

RBDPO: 120 °C

Low temp. Duty

+

High Temp. duty

RBDPO: 260 °C **from deodorization column**

From bleacher : BPO: ~100 °C

BPO: ~160/170 °C

BPO: ~235~240 °C **to final oil heater**

Or other type i.e. falling film/coil/S&T

Benefits from heat recovery plus+

– How to further improve heat recovery up to 85%

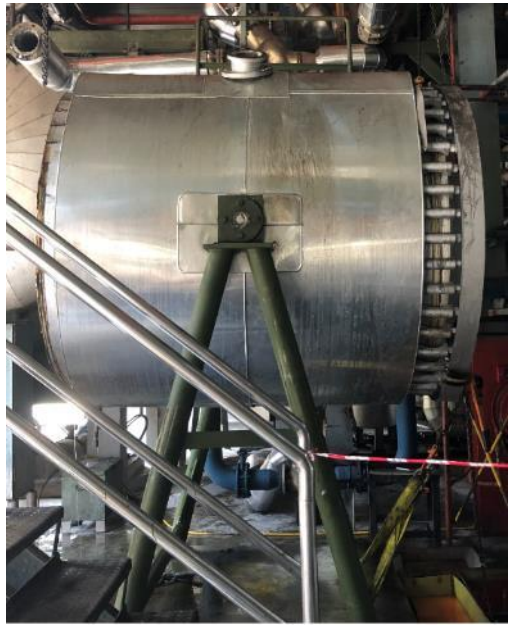
- Higher saving on natural gas/diesel fuel in High Pressure Boiler
- Lower overall capital cost with gasketed type at lower temperature duty
- Easy to retrofit into your existing heat recovery system
- Redundancy of operation/reduce downtime

Fuel savings 150-200 kEUR yearly

Reduce fouling & improve uptime with horizontal Spiral

– Self cleaning effect

Horizontal mode can infuse self-cleaning effect to minimize fouling and reduce cleaning frequency



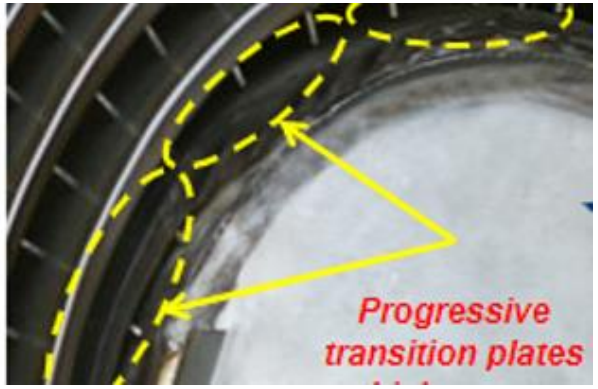
Better cleanability in spiral heat exchanger

– Open-open channel for better cleaning

- **Open-open channel - see through design**
- Better cleanability for BPO channel
- RBDPO channel is closed-closed channel

Minimize down time by body and plate welding difference

− Important for high temperature/pressure duty



Transition plate between the body and tubular center

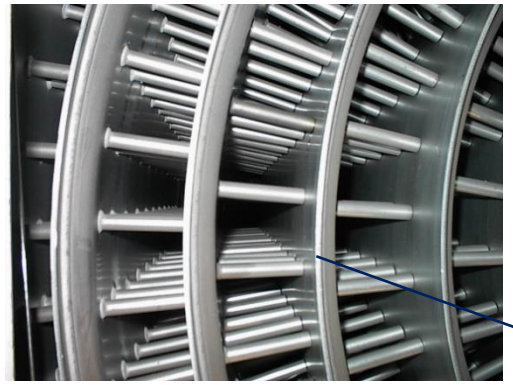
- Higher thermal & pressure fatigue resistance
- Less leaking - no intermixing of hot and cold side

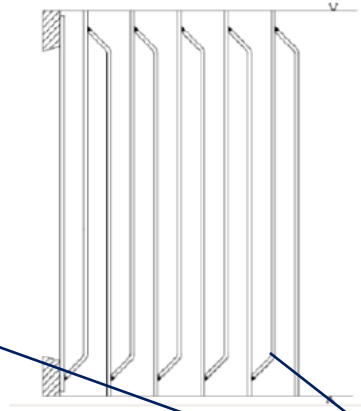
Reduce leaking with better channel closure welding

− Way of welding is important for welded type heat exchanger

CMT welding for channel closure

- Fast welding and smaller heat affected area
- More robust and less cracking issue
- Important for open-open channel





Channel closure

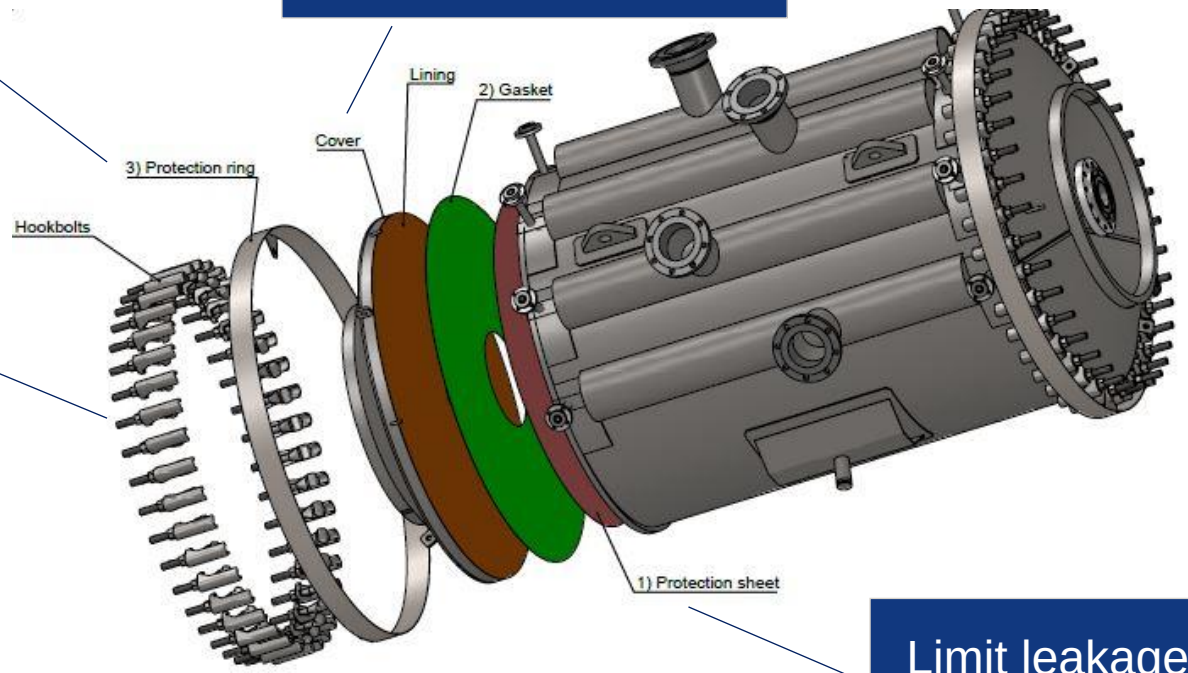
Improve rigidity and safety with vegetable oil package

− Specially designed for palm oil economizer

Limit projection in case of leakage

Reinforced cover to limit fluid bypass

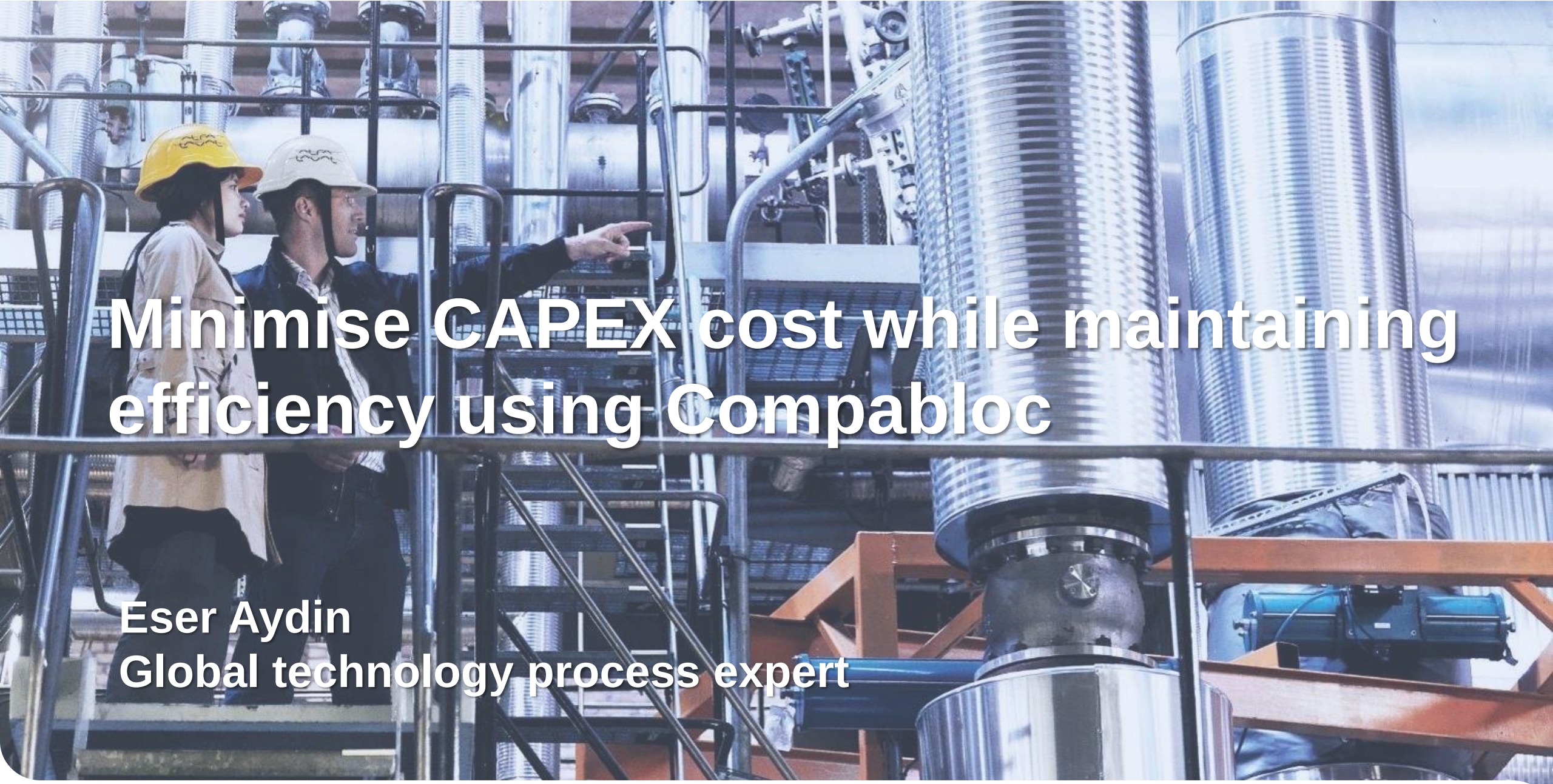
+30% hook bolts for better strength



Limit leakage and protect gasket from deforming

Save cost of ownership and boost heat recovery by Spiral Heat Exchanger

- 2-stage heat recovery - Better heat recovery to save fuel cost
- Horizontal spiral - Self-cleaning to improve uptime
- Alfa Laval spiral features - Better robustness to reduce leaking & downtime



Minimise CAPEX cost while maintaining efficiency using Compabloc

Eser Aydin
Global technology process expert

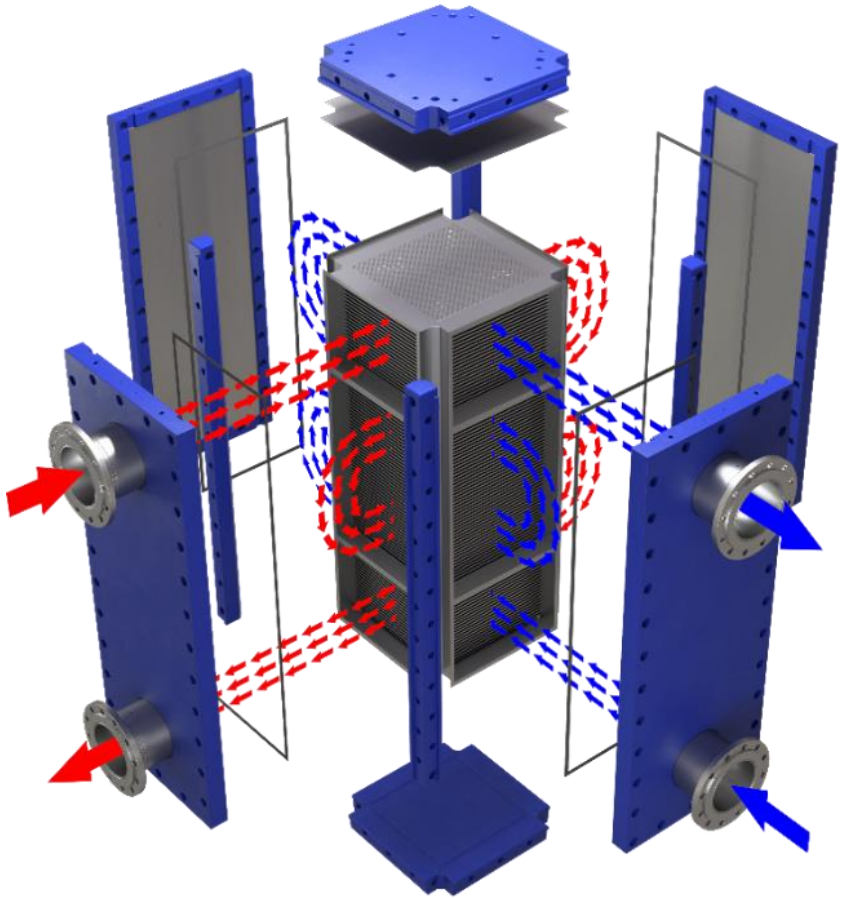
Refining challenges for efficiency and CAPEX

- High cost of installation for S&T heat exchange giving high project cost
- Lack of flexibility in plant expansion with reduced footprint
- Down time caused by improper selection of heat exchanger

Openable and fully cleanable for lifelong efficiency

– Compabloc Welded Heat Exchanger

- High efficiency
- Temperature cross
- High wall shear stress
- Low fouling built up
- Fully repairable
- Compact
- Fully cleanable
- From -46°C to 343°C as standard and up to 400°C on request
- From full vacuum to 40/42 barg



YouTube

1. Liquid to Liquid
2. Reboiler
3. 1-pass condenser
4. 2-pass condenser

Higher performance and compact footprint

− How to reduce installation cost?

Minimized size

- 5-10 times less installation & service space
- Saving in capital and installation cost

Reduced weight

- 2-5 times less flooded weight
- Saving in space and maintenance cost

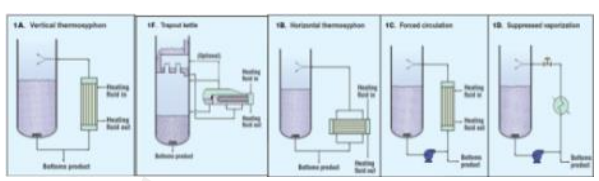
Smaller hold up volume

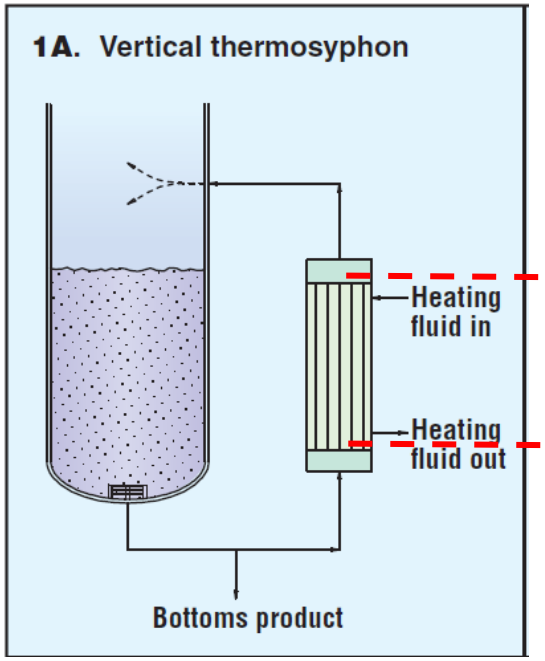
- Faster reaction during operation

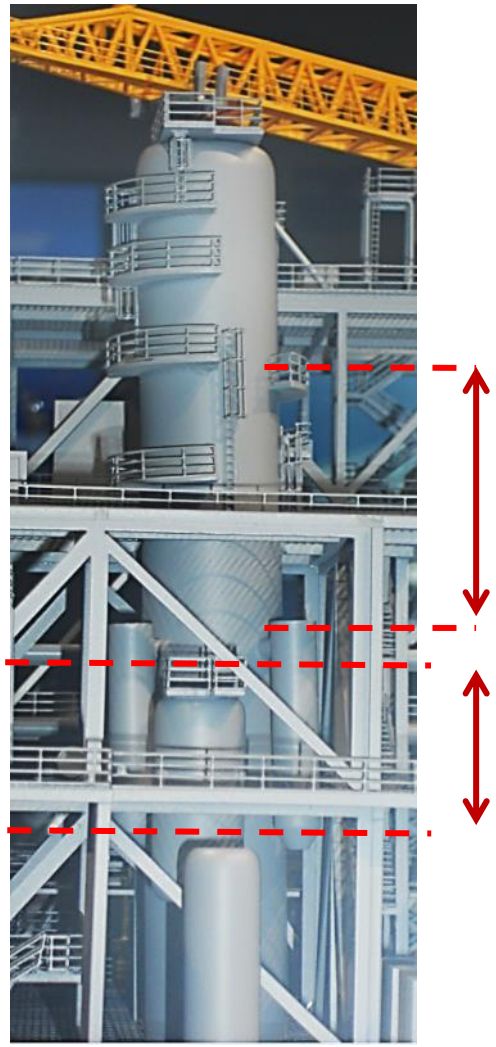
Advantages of Compabloc versus other technology

– How to reduce total investment cost

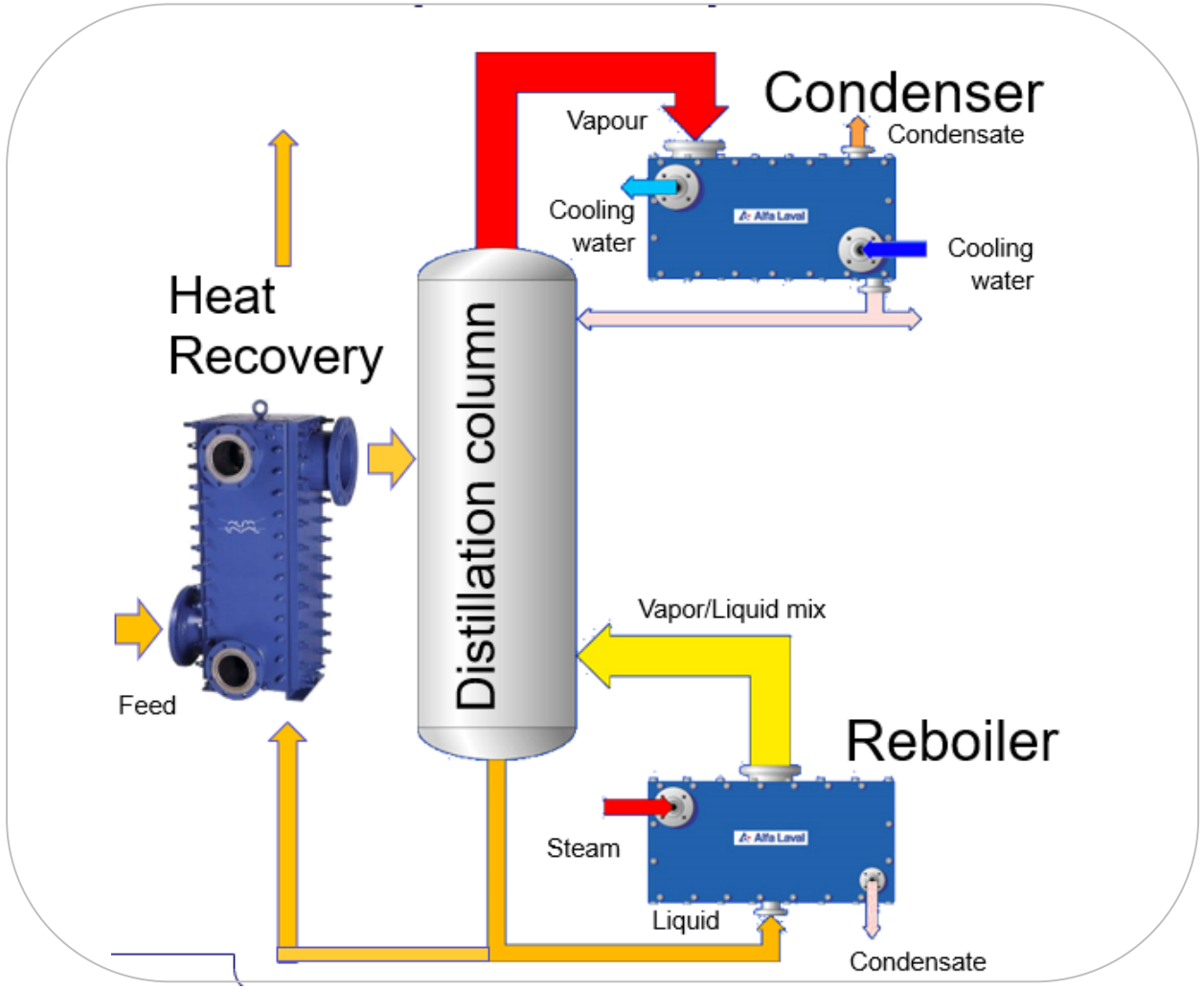
- Shorter column needed
- Free service space is not required above reboiler
- Less installation cost
- Less transportation cost
- Lower ΔT needed which can decrease the design & operation pressure of the columns
- Less investment cost for columns



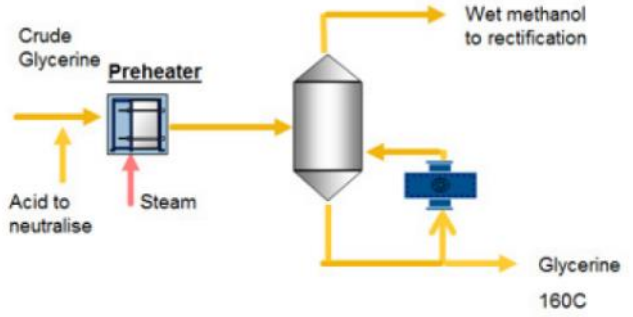




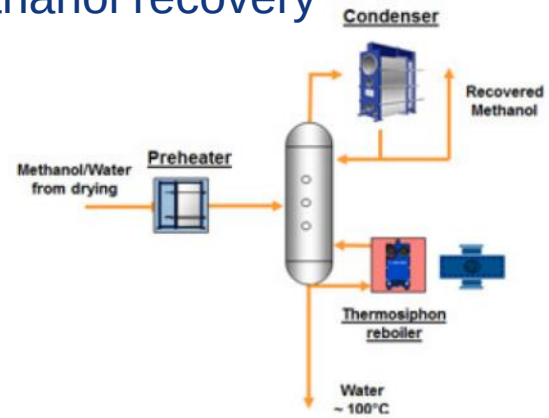
Reboiler and condenser in distillation column



Glycerin purification



Methanol recovery

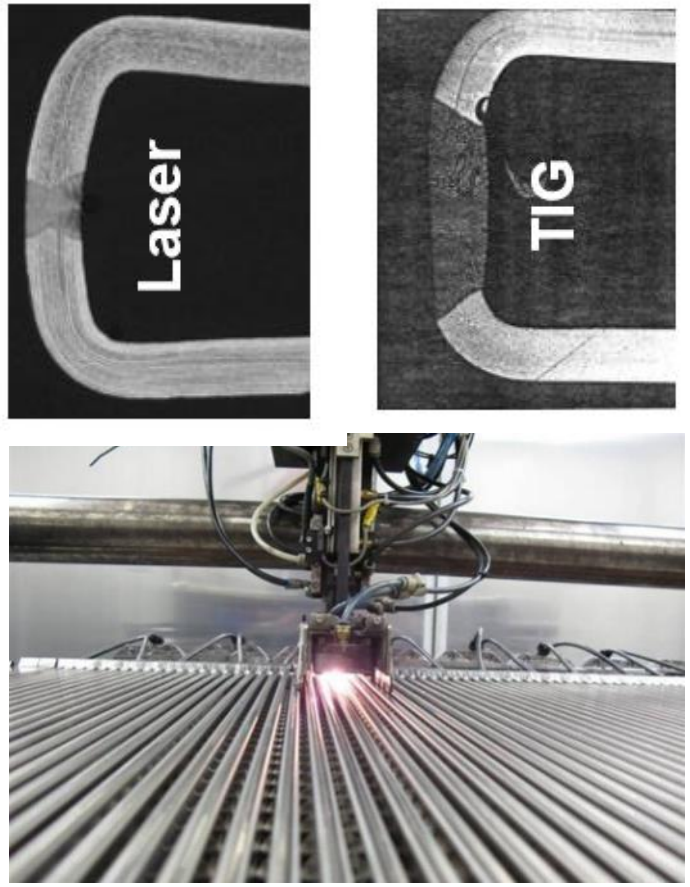


Reduce downtime with Laser welding technology

How to reduce downtime with the correct selection of Heat Exchanger?

Laser Welding technology for robustness

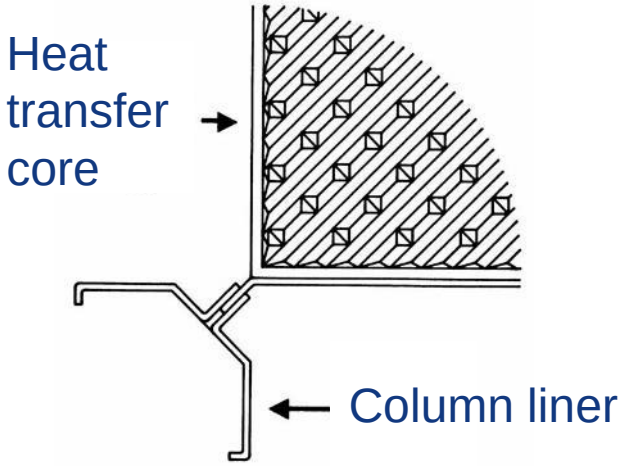
- End-to-end laser weld of the plates guarantees accessibility and protects against corrosion
- Minimal risk of corrosion
- Butt weld geometry with very strong joint, no place for cracks to start forming
- Laser welded joint with higher welding speed, smaller heat-affected zone and minimal residual stress.
- Essential for thin plates.

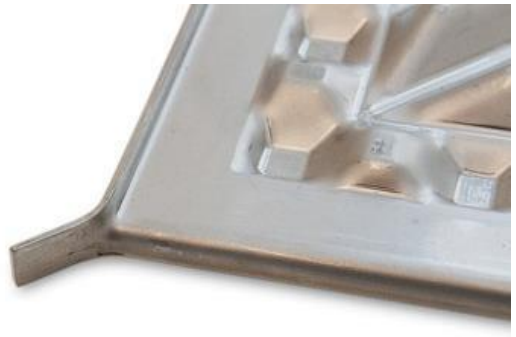


Watch C-Weld video here

Fully cleanable by unobstructed corners

Unobstructed corners



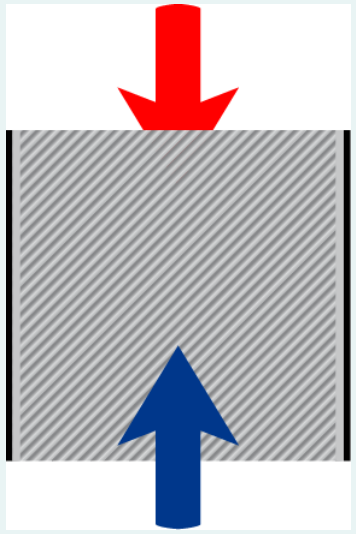


Tab

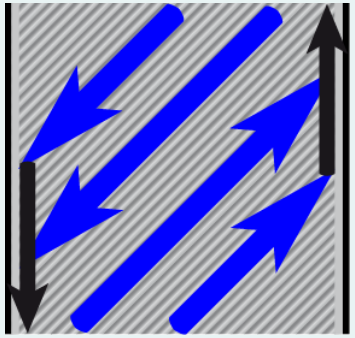
YouTube Watch Compabloc cleaning video here

Fully cleanable by unobstructed corners

– Fully Cleanable



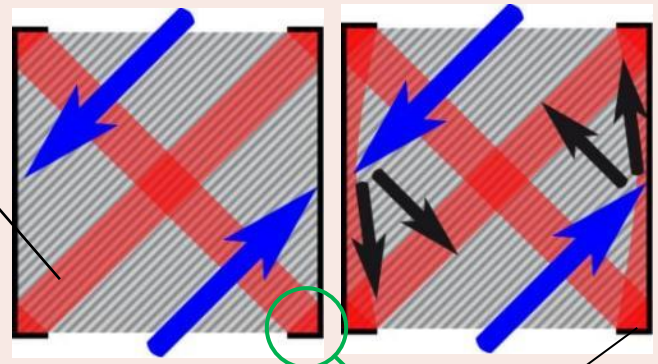
No stagnant zones

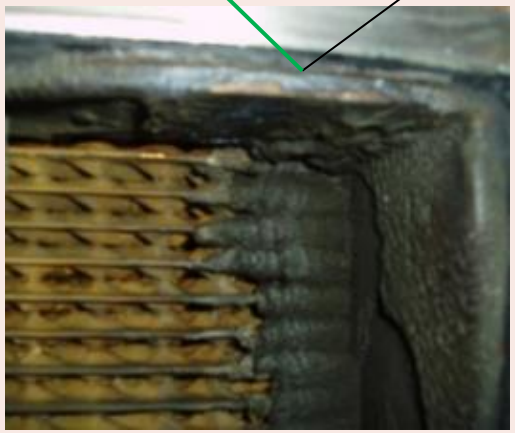


- 100% mechanically cleanable plates
- Good-as-new performance after cleaning.

Inefficient hydro jet

Ineffective cleaning





- Stagnant zones
- Poor cleanability
- Fouling flushed across the plates

Strong references in condensers and reboilers

- CP50 reboiler for glycerine purification column
- Rectification column reboiler
- Methanol recovery column reboilers in Europe
- Methanol recovery and glycerine purification column reboilers in South East Asia

Minimise CAPEX cost while maintaining efficiency using Compabloc

- Unique design
- High efficiency
- Fully cleanability
- Less installation cost and compact footprint

Robust solution for cyclic process conditions with Duroshell Heat Exchanger

Eser Aydin
Global technology process expert

Refining challenges in cyclic operations

- Limited heat exchanger selection for cyclic duties
- High total cost of ownership of shell and tube

Robustness for cyclic duties

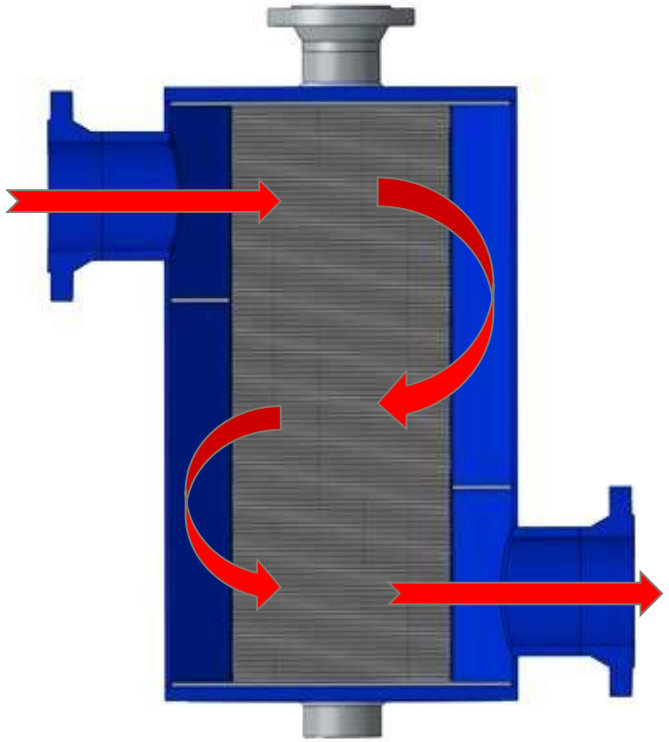
– Duroshell heat exchangers

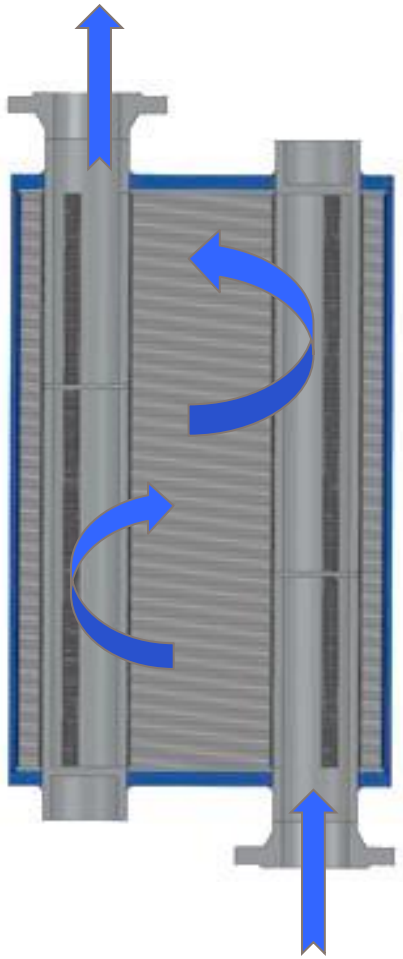
Specifically designed for demanding duties such as high pressure and high temperature applications

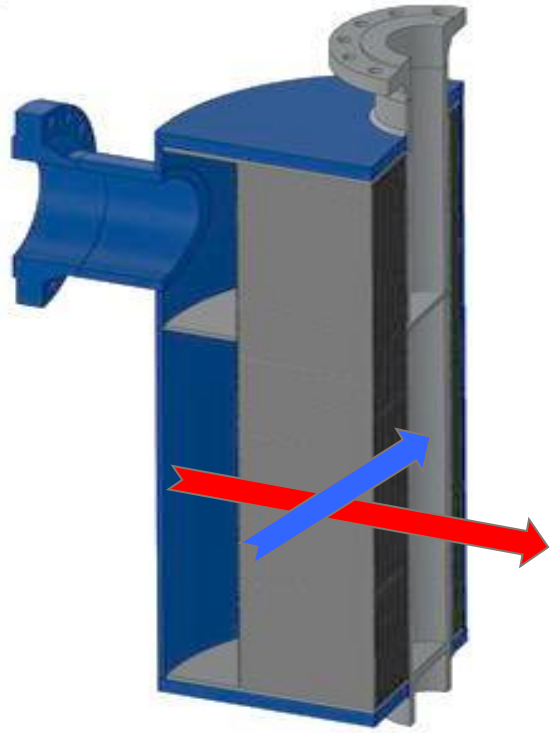
- Robustness due to unique design
- High resistance to thermal and mechanical fatigue
- Superior thermal performance
- Compact solution which you can save capital cost
- Design pressure: 100bar/FV
- Design temperature: -160°C/450°C

Compact design with flow path

– How Duroshell works

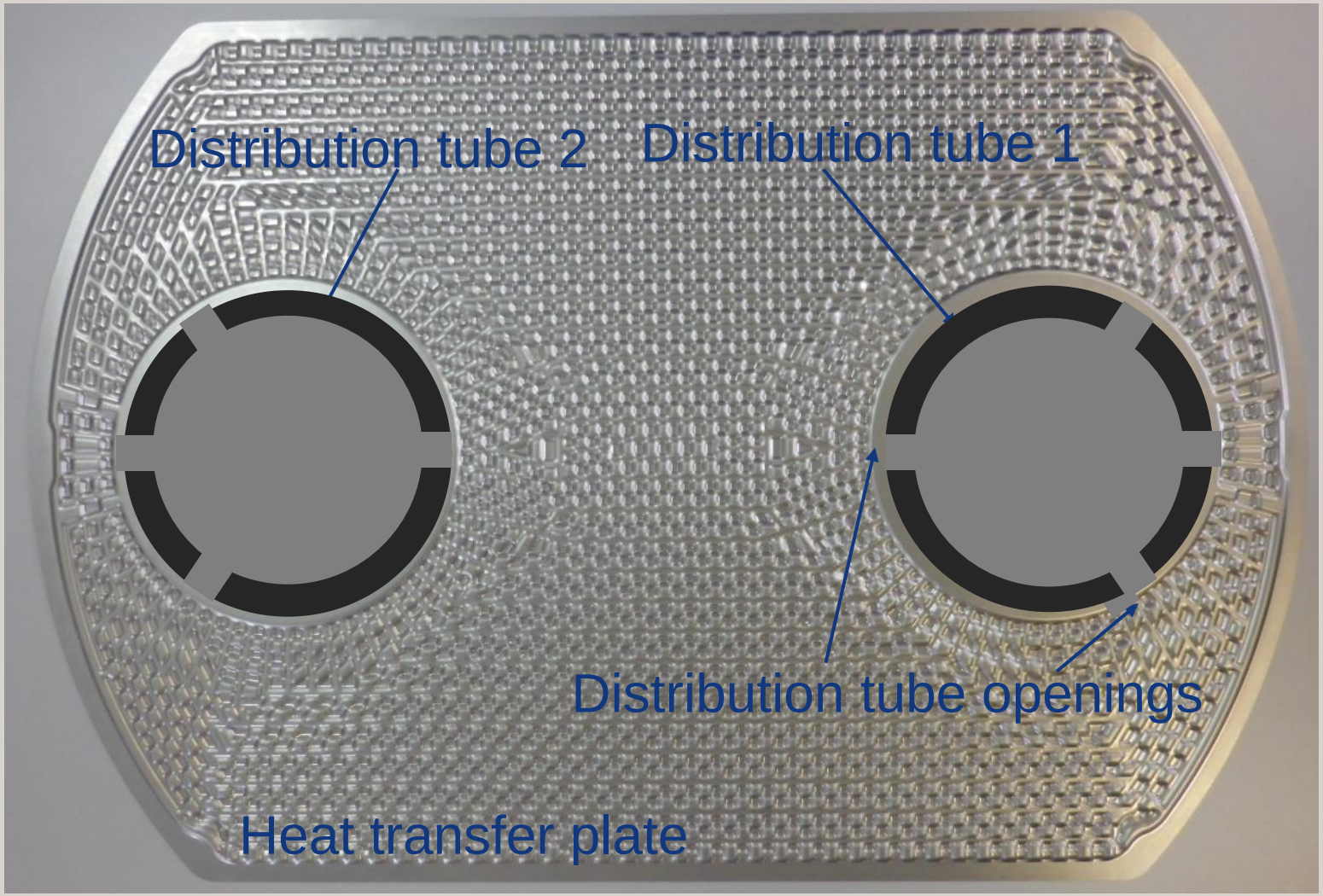


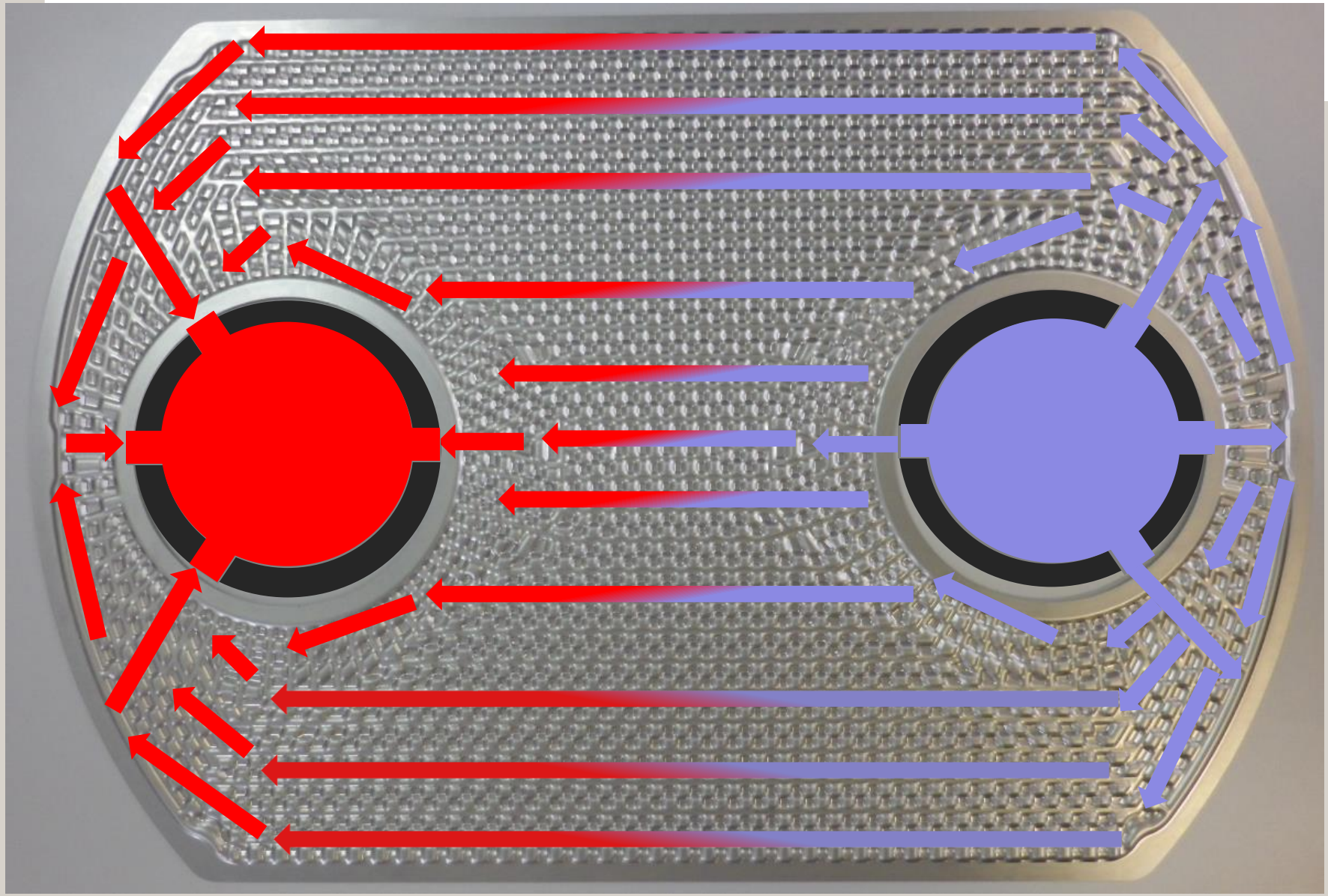


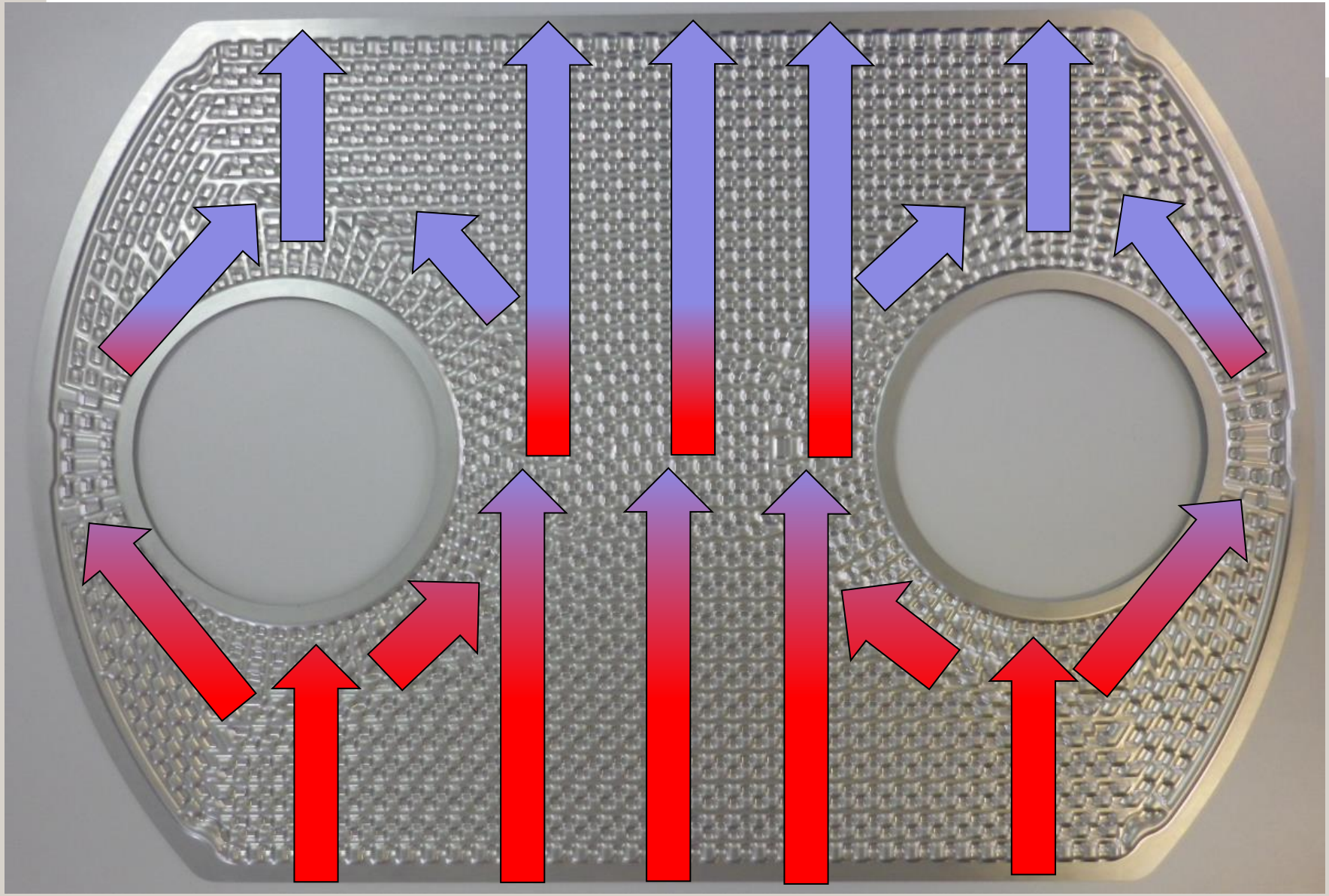


YouTube Watch Duroshell video here

Compact design with flow path







Compact solution for cyclic duty & stock change process

– Key features of DuroShell

Unique Cut Wings plate shape

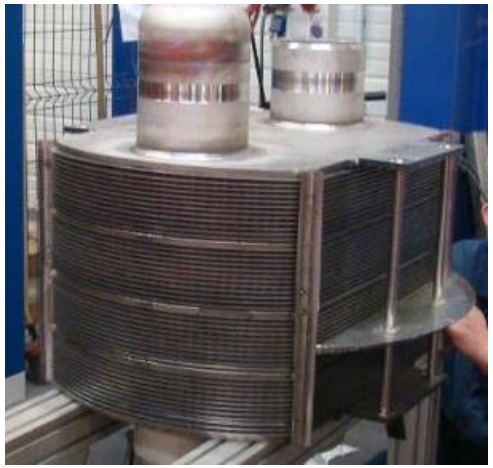
- High thermal flexibility (easy multi-pass)
- Excellent compacity
- Less weight

Watch Cut Wings plate video here

Power Pack distribution tubes through all plate packs

- Guide fluid for maximizing use of HTA
- Smaller footprint required
- Strengthen plate pack
- Increase fatigue resistance

Watch Power Pack distribution tubes video here



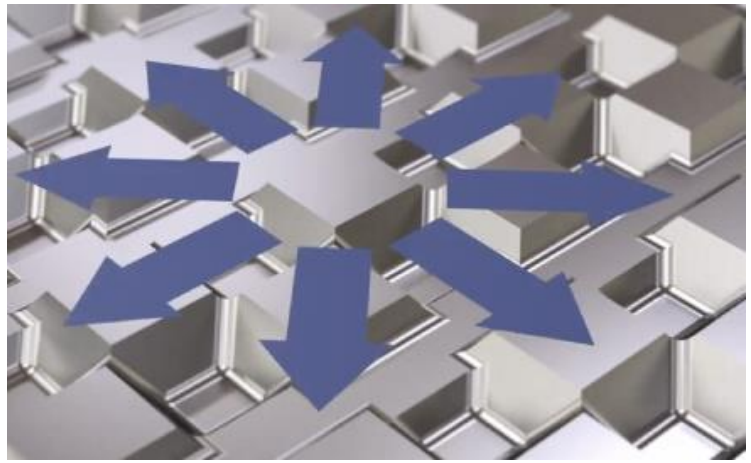
Compact solution for cyclic duty & stock change process

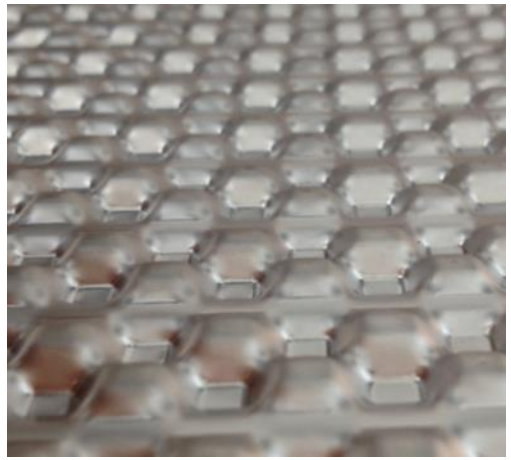
– Key features of DuroShell

Unique Roller Coaster plate pattern

- Humps up & down with homogeneous resistance acting as stiffeners in all directions
- Same resistance in homogeneous expansion
- Increased fatigue resistance
- Optimized flow distribution
- No peak stresses in port areas

YouTube Watch video here





Strong references in condenser and reboiler

- Heat recovery 1-phase & 2-phase
- Liquid heating / cooling
- Evaporation / Condensation
- Partial condensation
- Gas cooling

Robust solution for cyclic process conditions with Duroshell

- Unique design
- High efficiency
- Robustness for cyclic duties
- Less installation cost and compact footprint

1. Save cost of ownership and boost heat recovery - Spiral Heat Exchanger
2. Minimize CAPEX cost while maintaining the efficiency - Compabloc
3. Robust solution in cyclic process condition - Duroshell