

ACO ENGINEERING

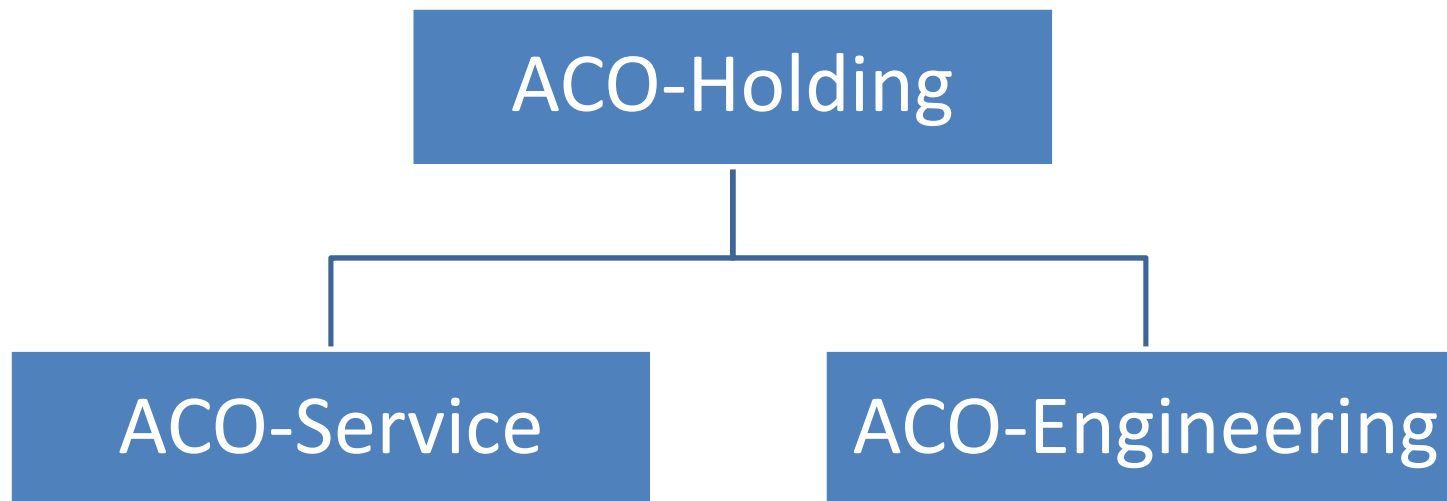
**ACO Engineering is
the global leader in
advanced heat
transfer technology –
providing substantial
energy savings
through customized
designs worldwide.**



ACO-ENGINEERING



ACO-Engineering & ACO-Service

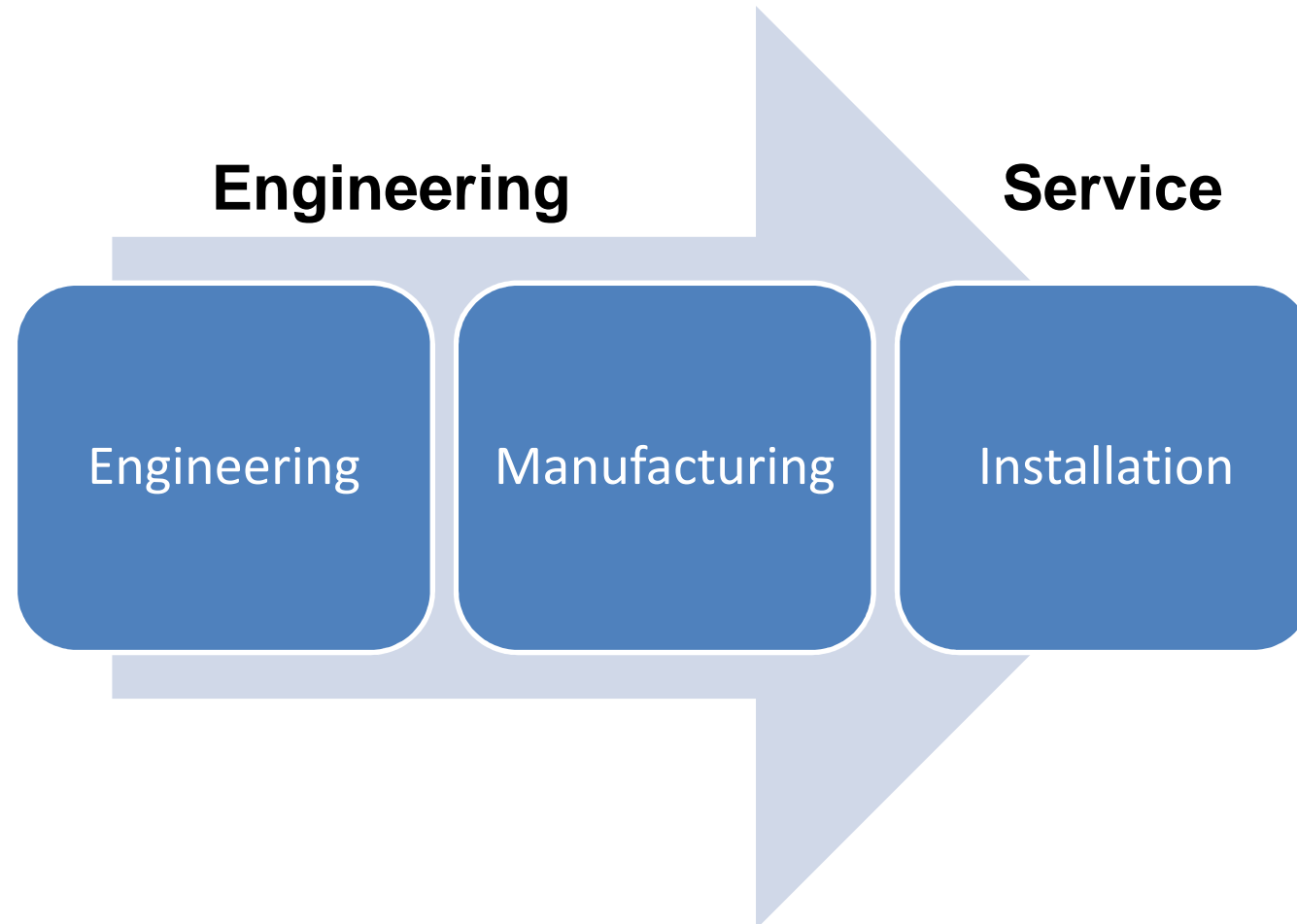


History – ACO-Engineering

- 1947: Elektrogeno was founded.
- 1979: Production of pillow plates was started.
- 1981: Elektrogeno changed its name to DEC Elektrogeno.
- 1986: Gadan aquired Elektrogeno.
- 1993: Niro aquired the company and
Niro Combi was established.
- 2000: ACO-Holding aquired Niro Combi
and ACO-Engineering was established.
- 2006: ACO-Service moved together with ACO-Engineering in
Kolding.



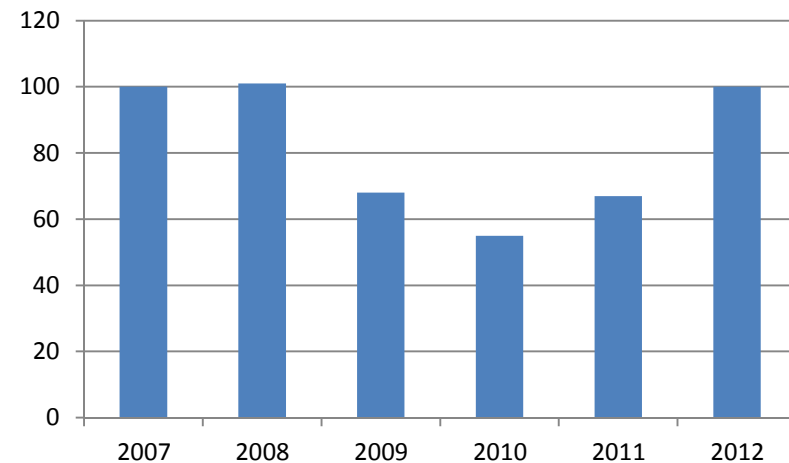
ACO-Engineering & ACO-Service



ACO-Engineering

- Current number of employees: 90
- Turnover: 13 mill. €
- Own engineering and development department.
- 60 years of experience.
- Fluently spoken languages:
 - Danish
 - Swedish
 - English
 - German

Turnover in million DKK



ACO-Engineering

Speciality:

- 95 % export world wide
- Easy to do business with ACO.
- Engineering and manufacturing of stainless steel components, with high customer demands (ASME PED etc.) for the process industry.
- High quality level with traceability.
- High delivery performance.

Facilities

- 10.000 m² modern production plant.



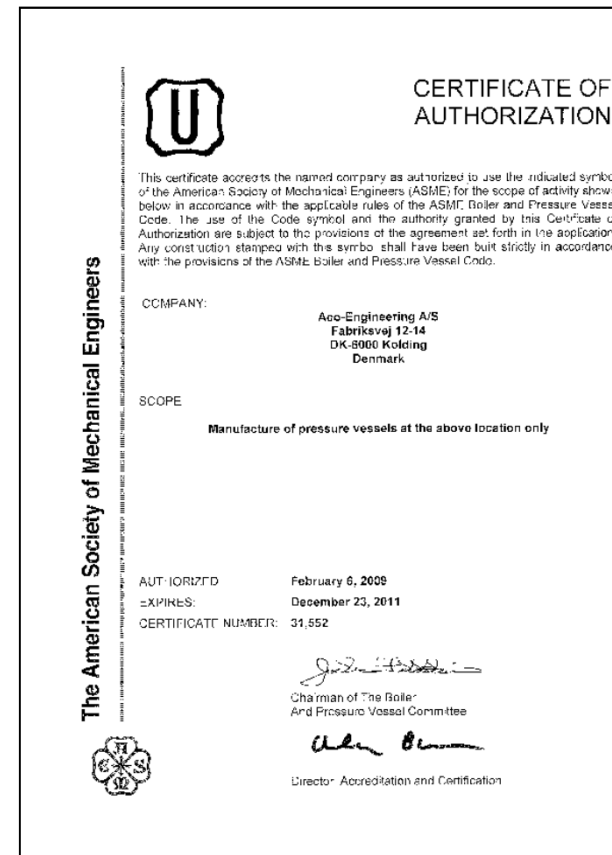
Machines and equipment:

- 6 kw Laser cutting Machine (2,5 x 6,5 m)
- Plasma welding
- Spot welding
- Seam welding

Process		
Proces	Max size	Remarks
Laser cutting	2500x6000x30	Stainless steel
Plasma welding	4000x12 mm	
Spot welding	6000x2000	
Seam welding	6000x2000	

Certificates

- ASME certificate
- PED certificate
- TÜV certificate
- AD Merkblätter
- SPVC
- CODAP
- Stoomvesen



Thermo Products

- Thermodynamic calculations.
- Designed according to the customers needs.
- Thermo products.
 - Heat exchangers
 - Process therm
 - Condensers
 - Evaporators
 - Cool-/ heating plates
- Application we server :
 - Food & Pharma
 - Chemical
 - Petrochemical
 - Pulp and paper



Comparison table

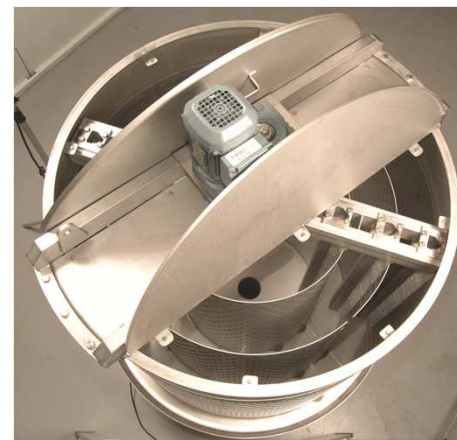
Advantages compared with other types of heat exchangers				
	Thermo plates	Shell and tube exchangers	Gasketed heat exchangers	Spiral heat exchangers
Temperature range, operation	up to 800 °C	up to 800 °C	up to 170 °C	up to 350 °C
Maximum pressure	up to 60 bar	up to 200 bar	up to 32 bar	up to 25 bar
Comparable K-values in water [kcal/m ² h °C]	2200	1700	3500	1200
Air or gas to water applications	suitable	suitable	not suitable	limited use
Submerge into tanks or rivers	yes	limited	no	no
Weld to tanks and reactors	yes	no	no	no
Build into existing towers, etc.	very flexible	limited	no	no
Fully welded construction	yes	yes	no	no
Applies to heavy polluted liquids/gasses	yes	yes	limited	yes
Weight compared with area	low end	high end	low end	high end
Falling film, condenser and evaporators	suitable	suitable	limited	limited

Cylindric Tower Cooler

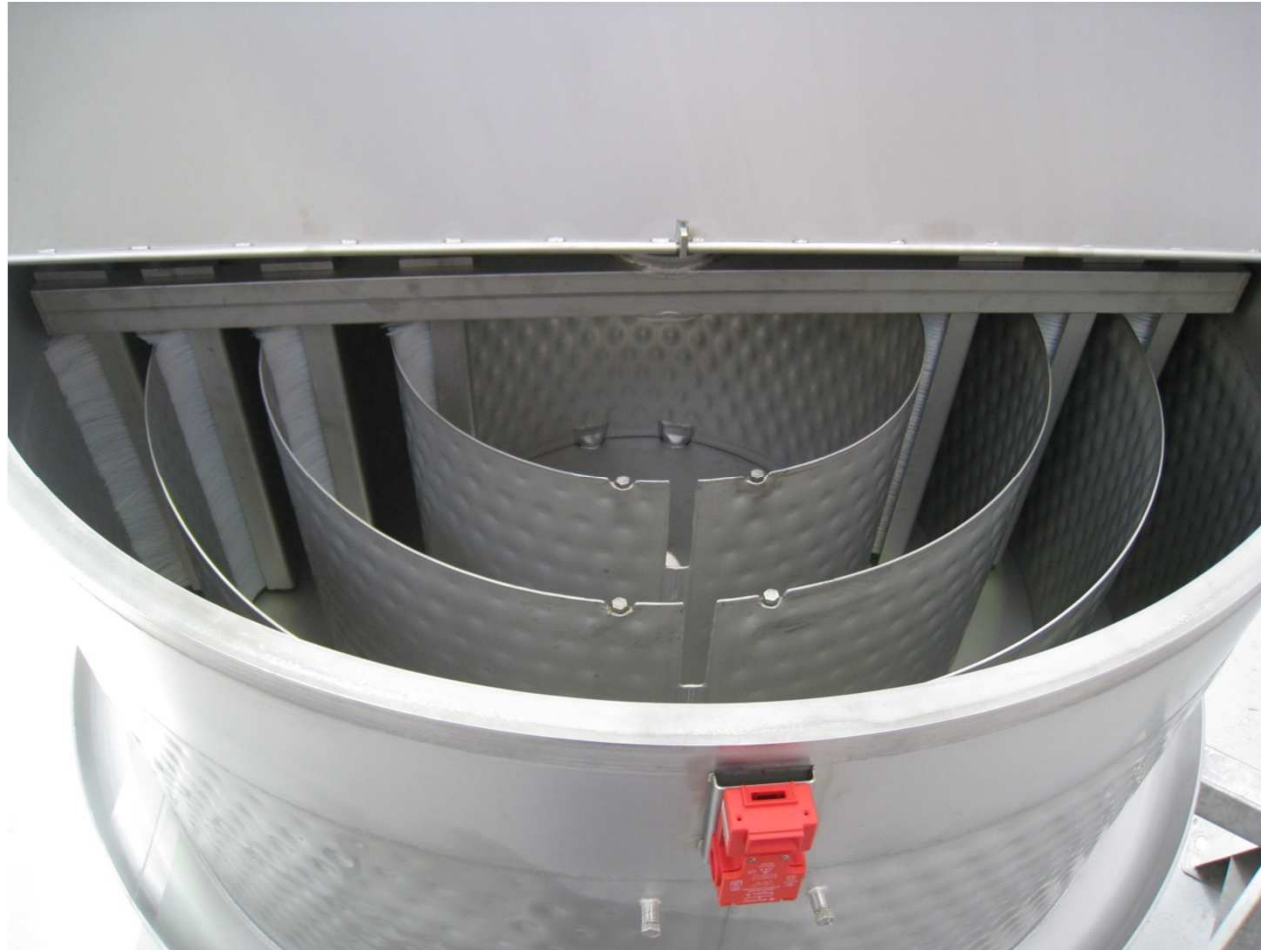


Therm-X

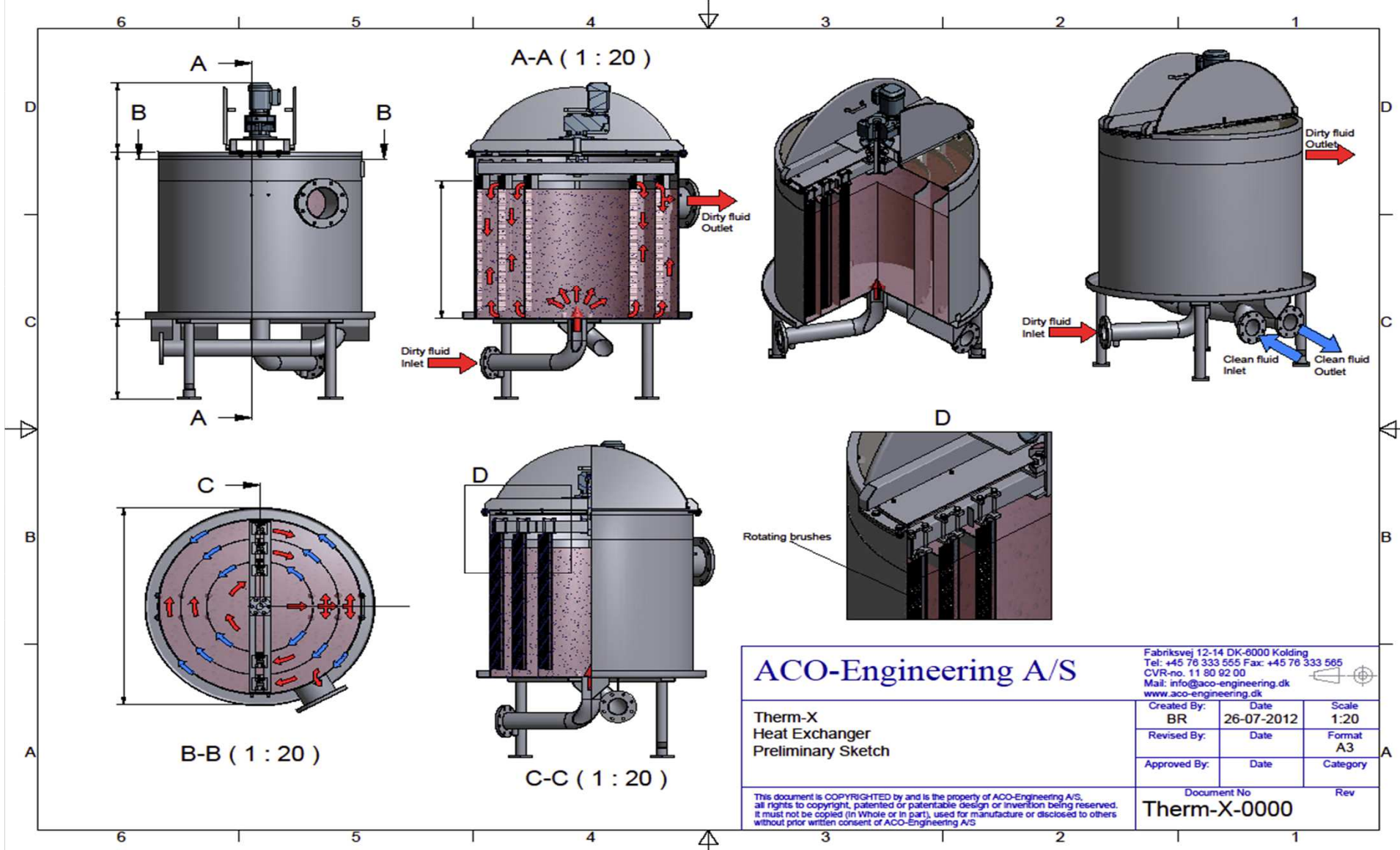
- Therm-X is a self-cleaning heat exchanger.
- Specially designed for heat recovery, cooling and heating of fibre-containing or unclean process liquids.
- Have continuous cleaning do to attached brushes. Low maintainers cost.
- The heat exchanger can be used with a line of cooling/heating media like steam, water and ammonia.



Mechanical Cleaning



Therm-X



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Therm-X
 Heat Exchanger
 Preliminary Sketch

Created By:	BR	Date:	26-07-2012	Scale:	1:20
Revised By:		Date:		Format:	A3
Approved By:		Date:		Category:	

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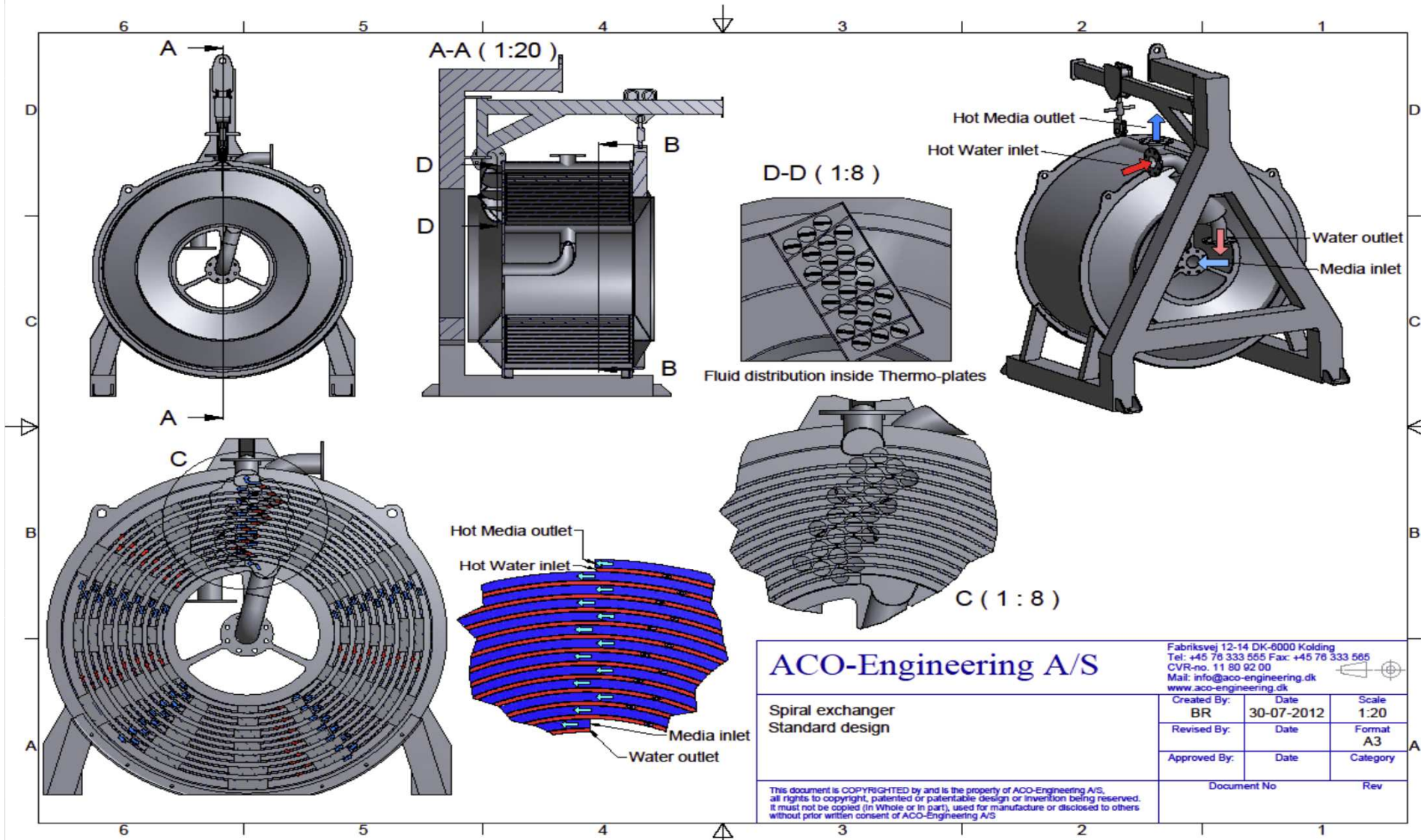
Document No	Rev
Therm-X-0000	

Spiral Heat Exchanger

- Allows dirty fluid or sludge to pass on the free side and clean water or gas to flow inside the pillow plates.
- Easy to inspect and clean – thereby minimizing maintenance.
- Design optimizes the heat transfer and flow conditions.
- inspection and cleaning, which is way the cost of maintaining is at a low level.
- better turbulence and efficiency than conventional spiral heat exchangers, due to the pillow shape of the plates.



Spiral Heat Exchanger



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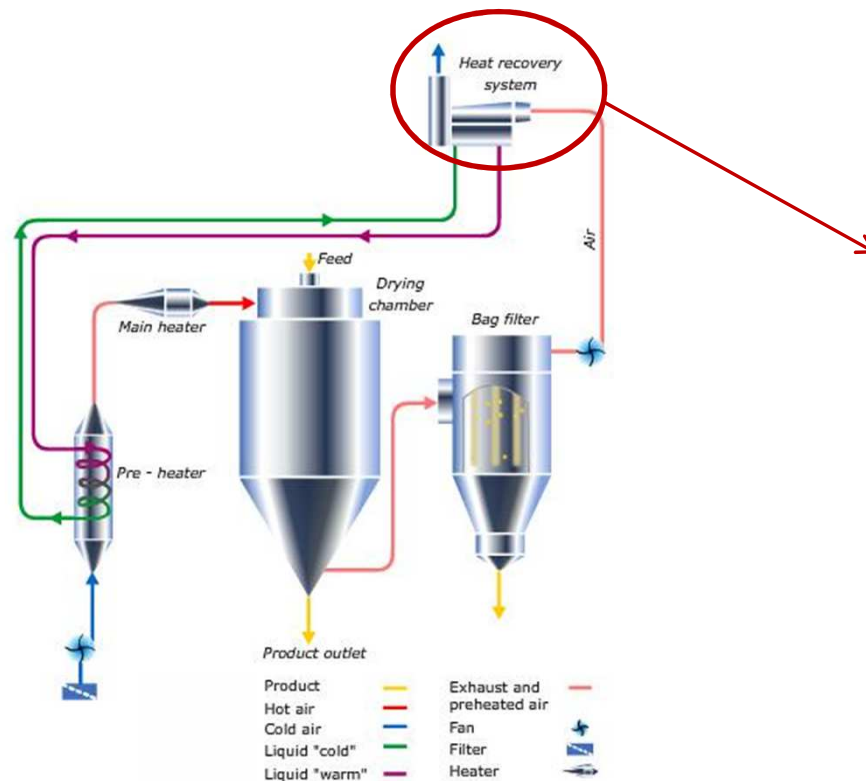
Spiral exchanger
 Standard design

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Revised By:	Date	Format
Approved By:	Date	Category
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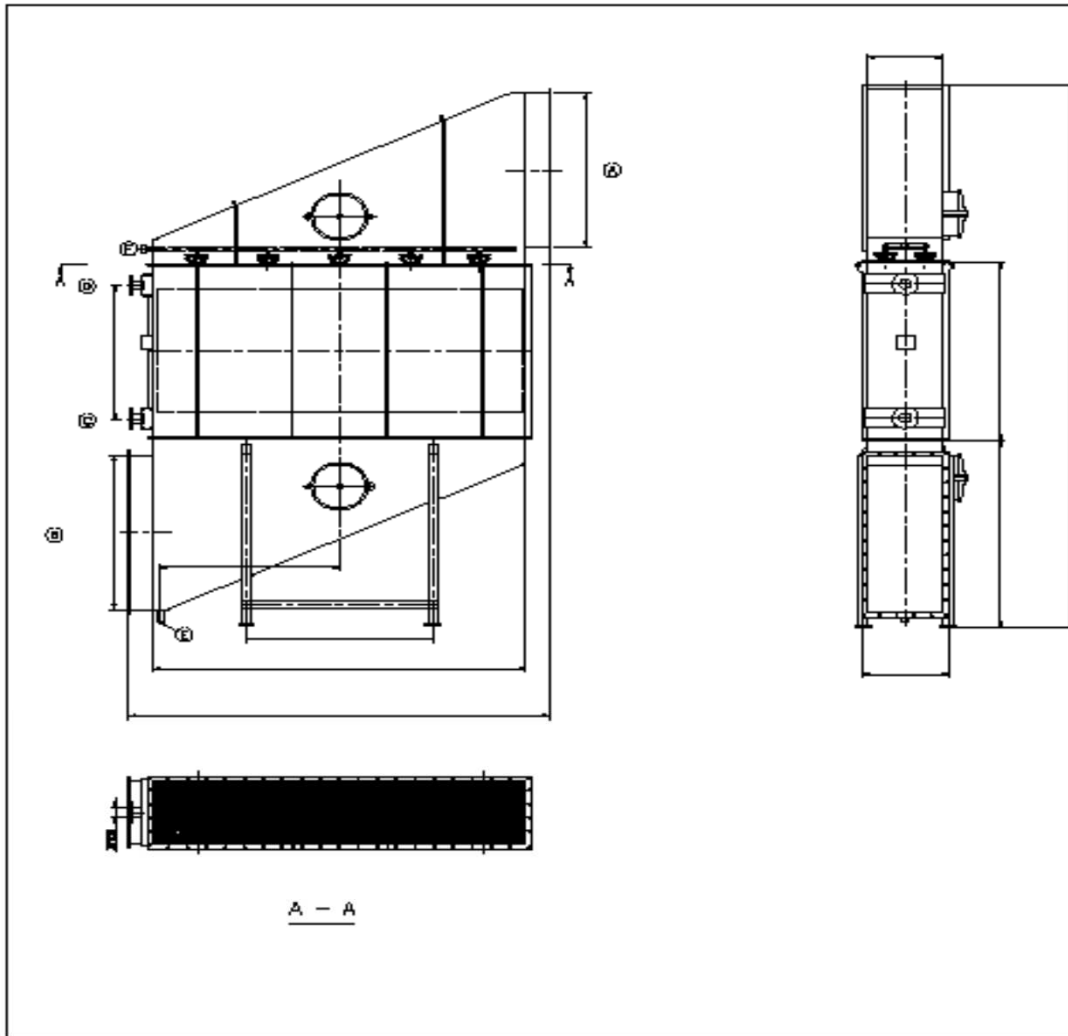
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Process Therm

- Saving energy by recovering discharge air.
- Comes with an integrated CIP system.
- A quick pay-back time.



Process Therm: With manifold



A	Gas Inlet		
B	Gas outlet		
C	Water Inlet		DN 2576 PN10
D	Water outlet		DN 2576 PN10
E	Drain		DN 2576 PN10
F	CIP		Socket (FTS)

TECHNICAL SPECIFICATIONS

BATTERY	
MATERIAL	
NUMBER OF T-P	
DIMENSION	
SIZE	
DESIGN PRESSURE	
DESIGN TEMPERATURE	
TEST PRESSURE	
VOLUME liter	
MEDIUM	
SHELL	
MATERIAL	
DESIGN PRESSURE bar	
DESIGN TEMPERATURE grc	
FINISH	
WEIGHT kg (empty)	
WEIGHT kg (in operation)	

Plan No.	Scale	Date	Author	Design No. or Reg. No.
ACO-ENGINEERING A/S	1:10			
PROJECT NO.			WEIGHT	
			Material	
			Exhaust Recuperator	
			Proj.:	
			Preliminary dim. Sketch	
			0	
No. of sheets			Sheet No.	

Process Therm



Top after production

- Milk powder
- After 16 hours



CIP after production

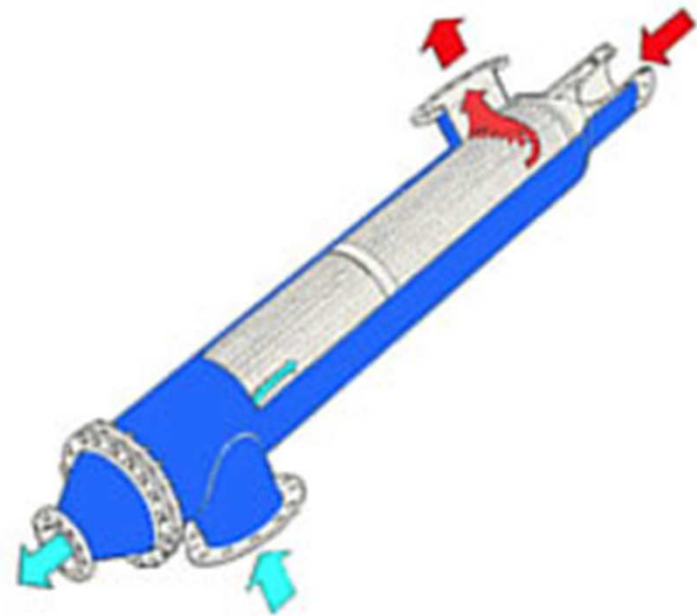


Process Therm

Exhaust gas cooler (Skjern paper factory - 5 MW)



TP HEX

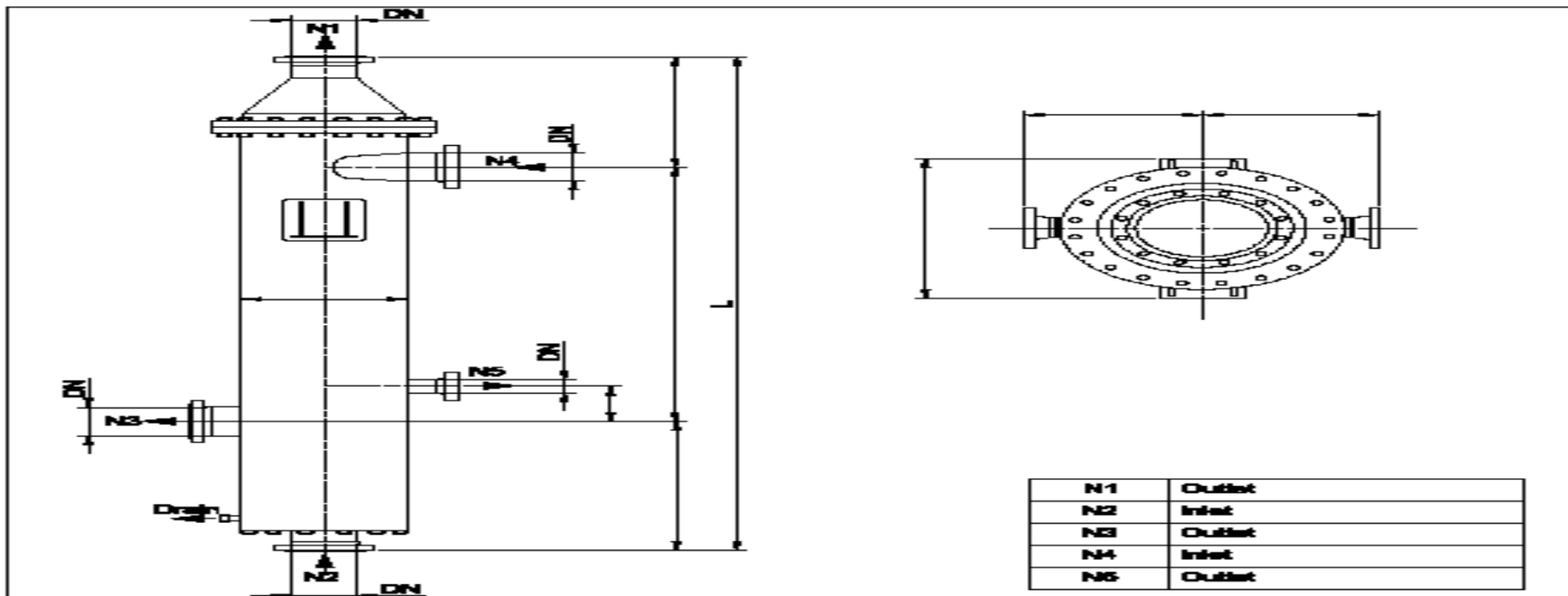


TP HEX

- longitudinal flow on both sides.
- Better base for heat transfer per m³ than other similar products.
- Compact design - valued when installing the product in existing plants.
- The perfect match for a wide range of fuses within the liquid-to-liquid heat transfer.
- Low maintainers cost.



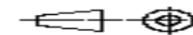
TP HEX



	BATTERY SIDE	SHELL SIDE
MEDIUM		
MATERIAL		
DESIGN PRESSURE		
DESIGN TEMPERATURE		
FLANGES	ANSI/DIN	ANSI/DIN

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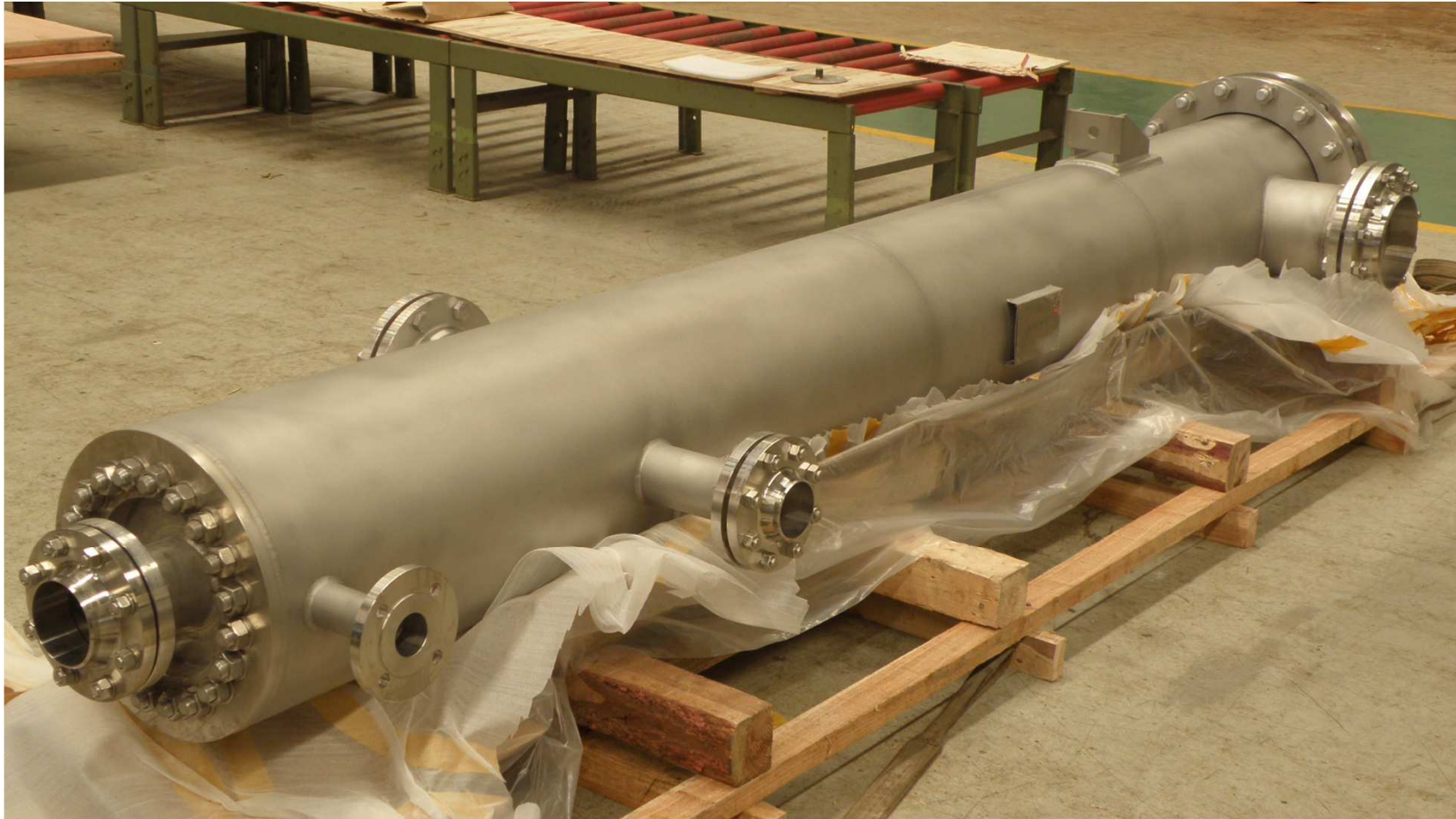
Preliminary Dimension Sketch
 Thermoplate-Lamella Heat Exchanger
 ACO TP HEX/Condenser w. Inert connection
 Mass:

Created by: BR	Date: 18-07-12	Scale
Revised by:	Date:	Format A4P
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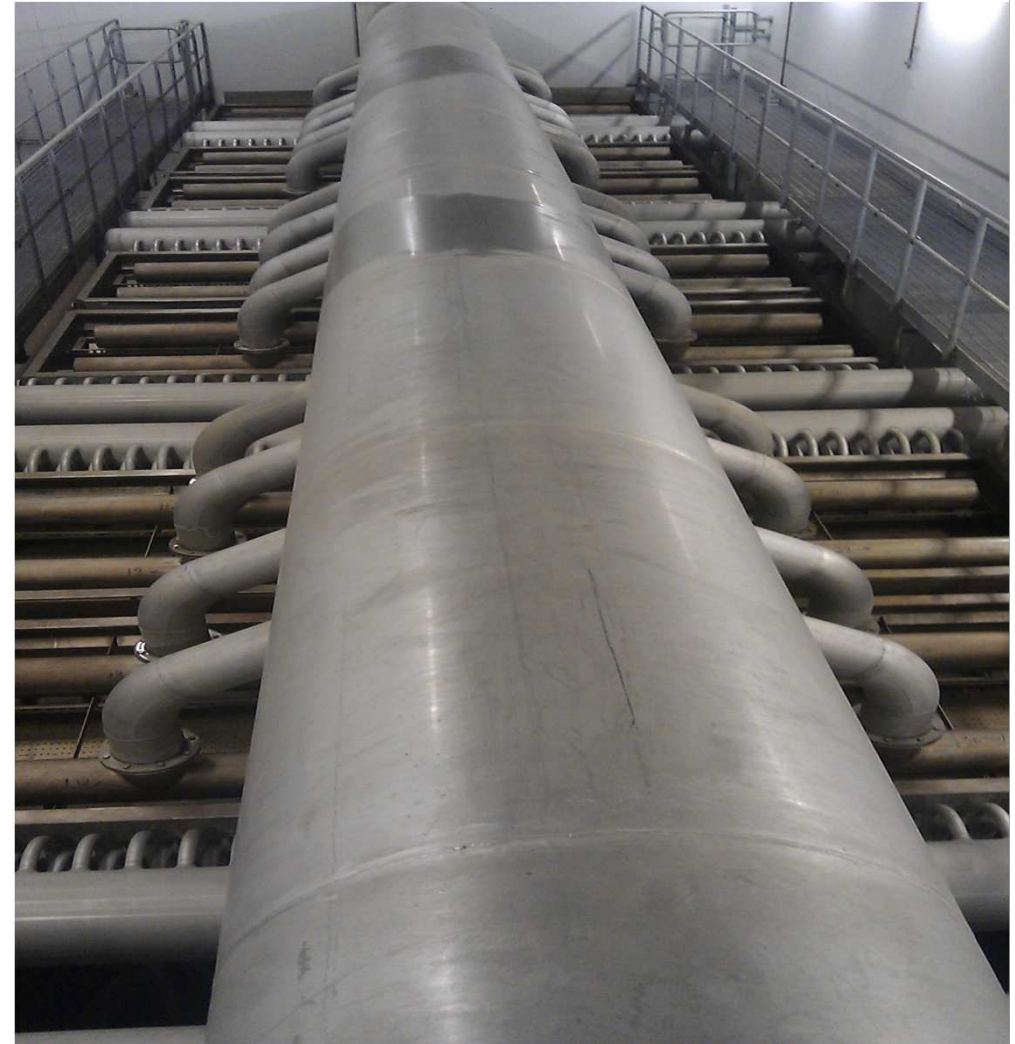
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TPX Finish product

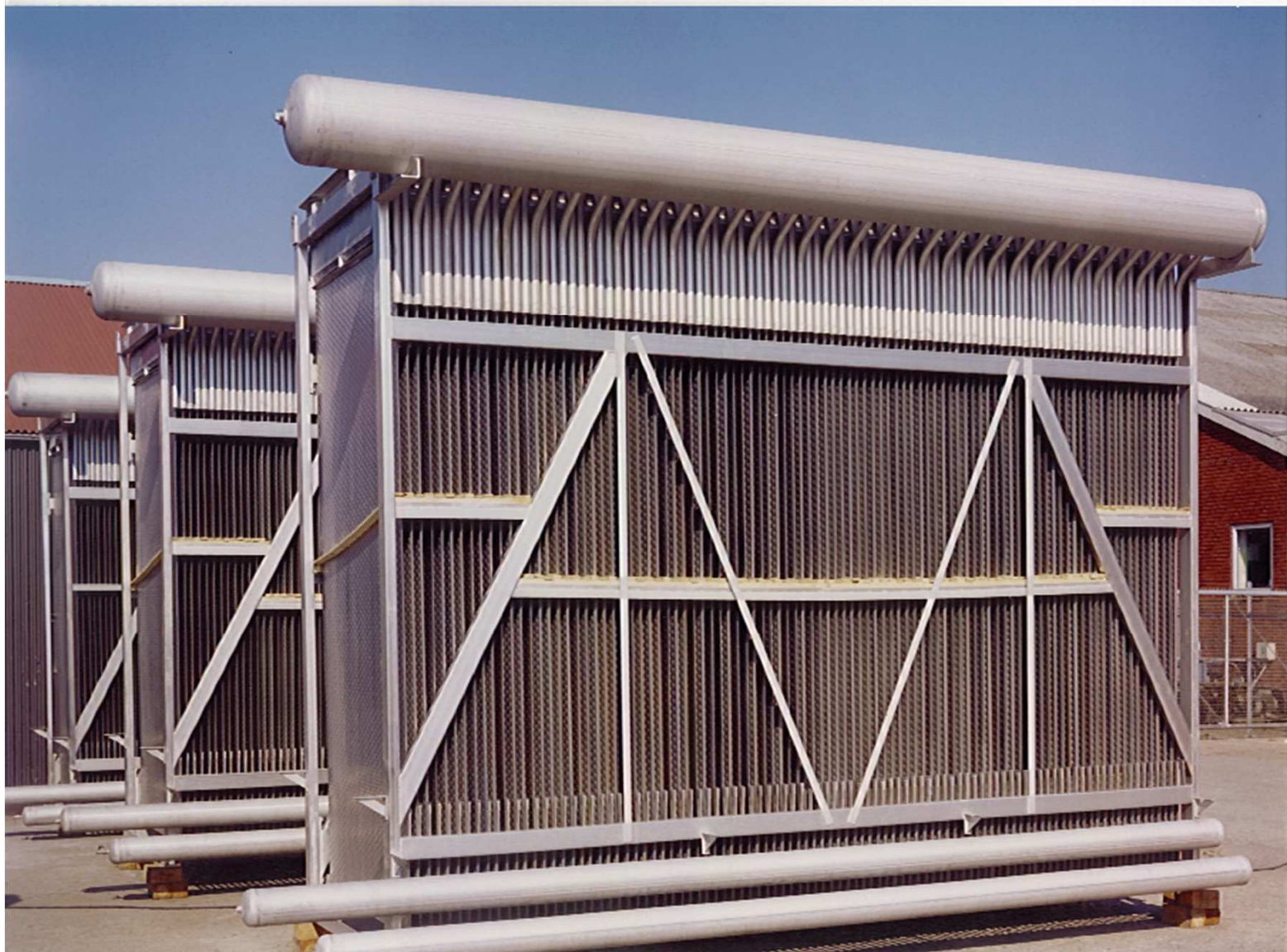


Falling Film

- A method for recovering heat from, for example hot process water.
- Water distribution system.
- Produced completely in stainless steel.
- High heat transfer efficiency.
- High hygiene standards.



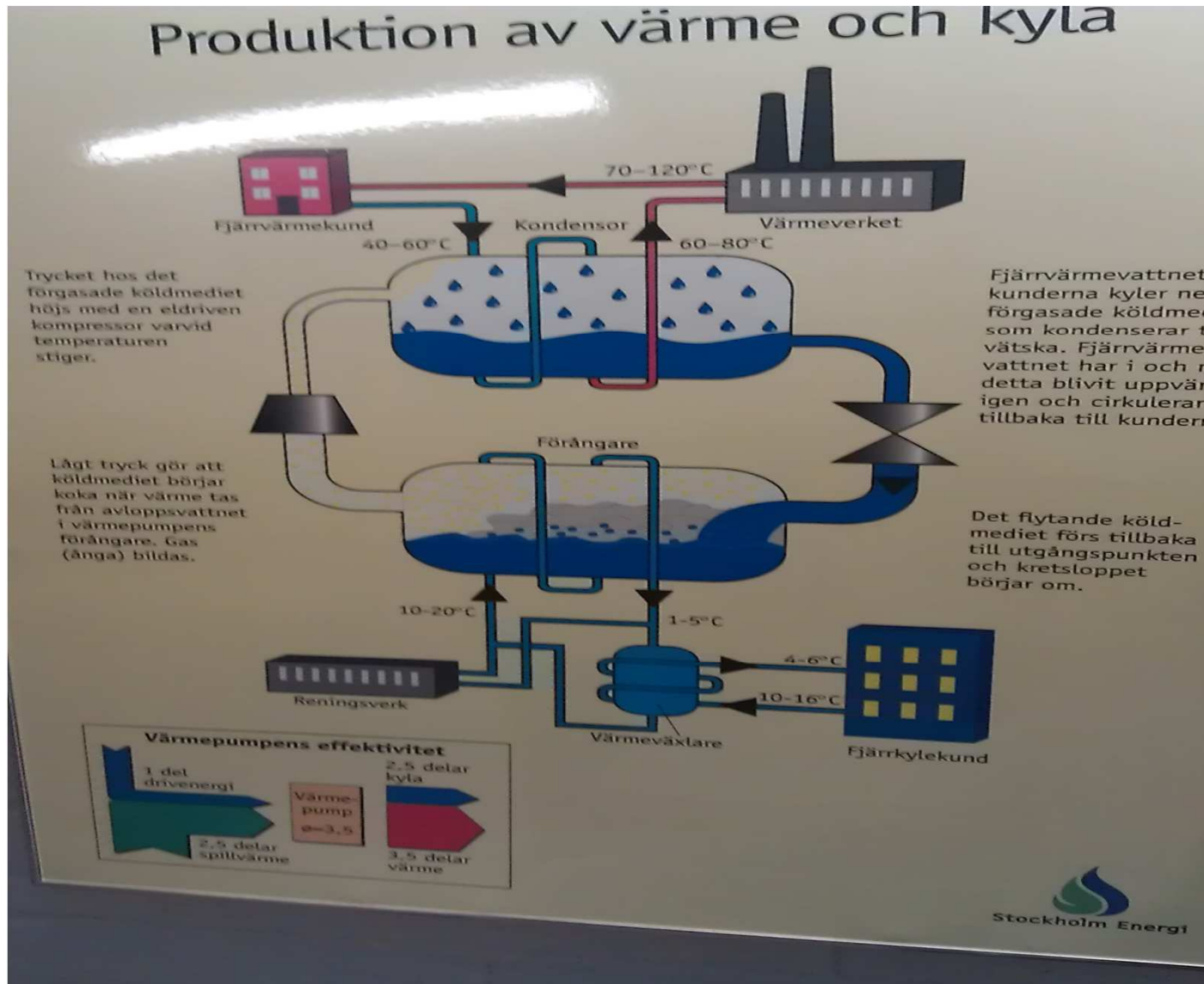
Falling Film



Falling Film



Falling Film



Heat Exchanger Banks – Plate Banks

- Built with pillow plates technology.
- Are made exclusively to fit the customer's wants and needs.
- The possibilities of variation in the geometric shape are almost limitless.
- Primarily built as liquid/liquid banks – but can also made as an gas/Liquid solution.
- High flexibility do to custom-made designs.



Emmersion cooler

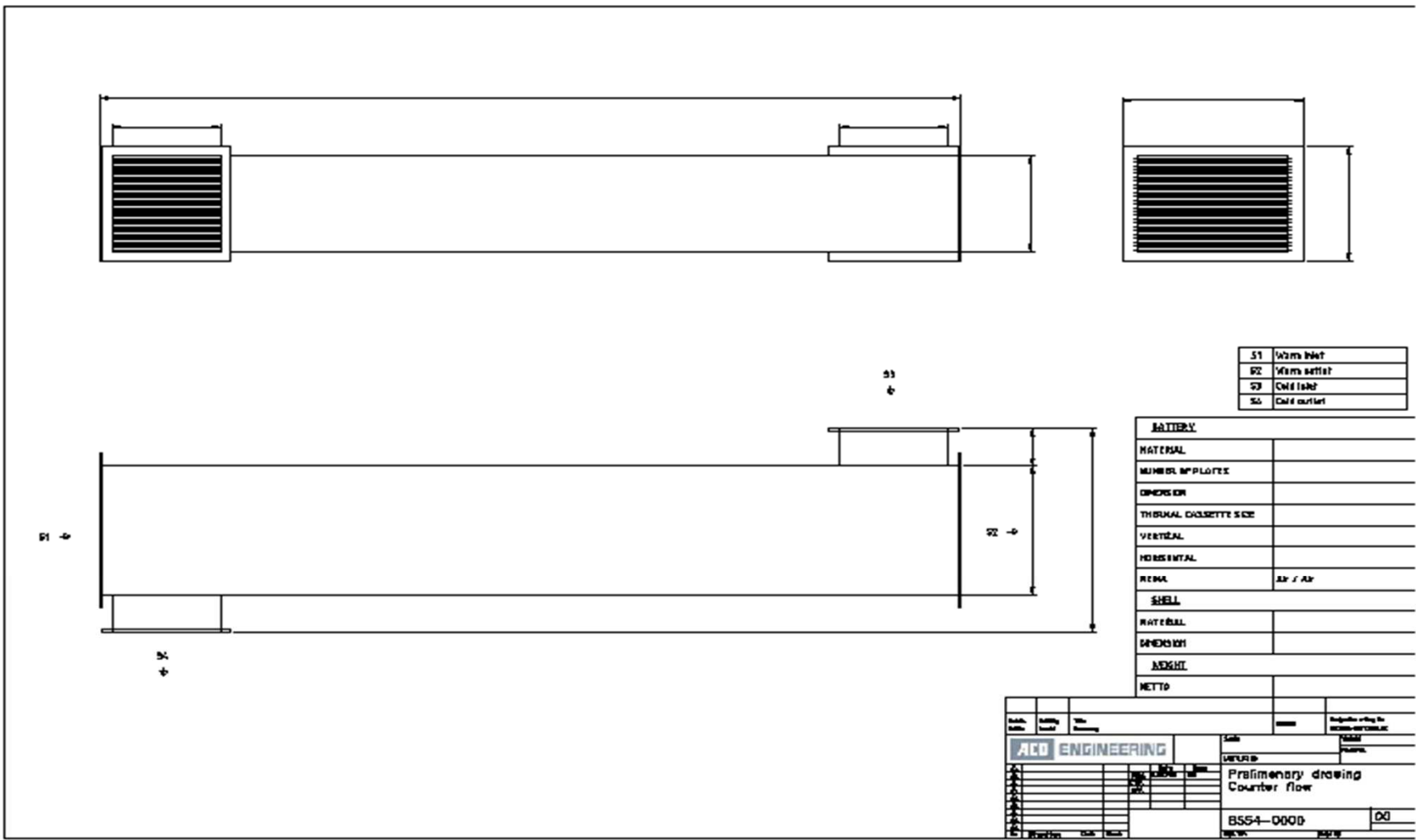


AIR to AIR Heat Exchanger

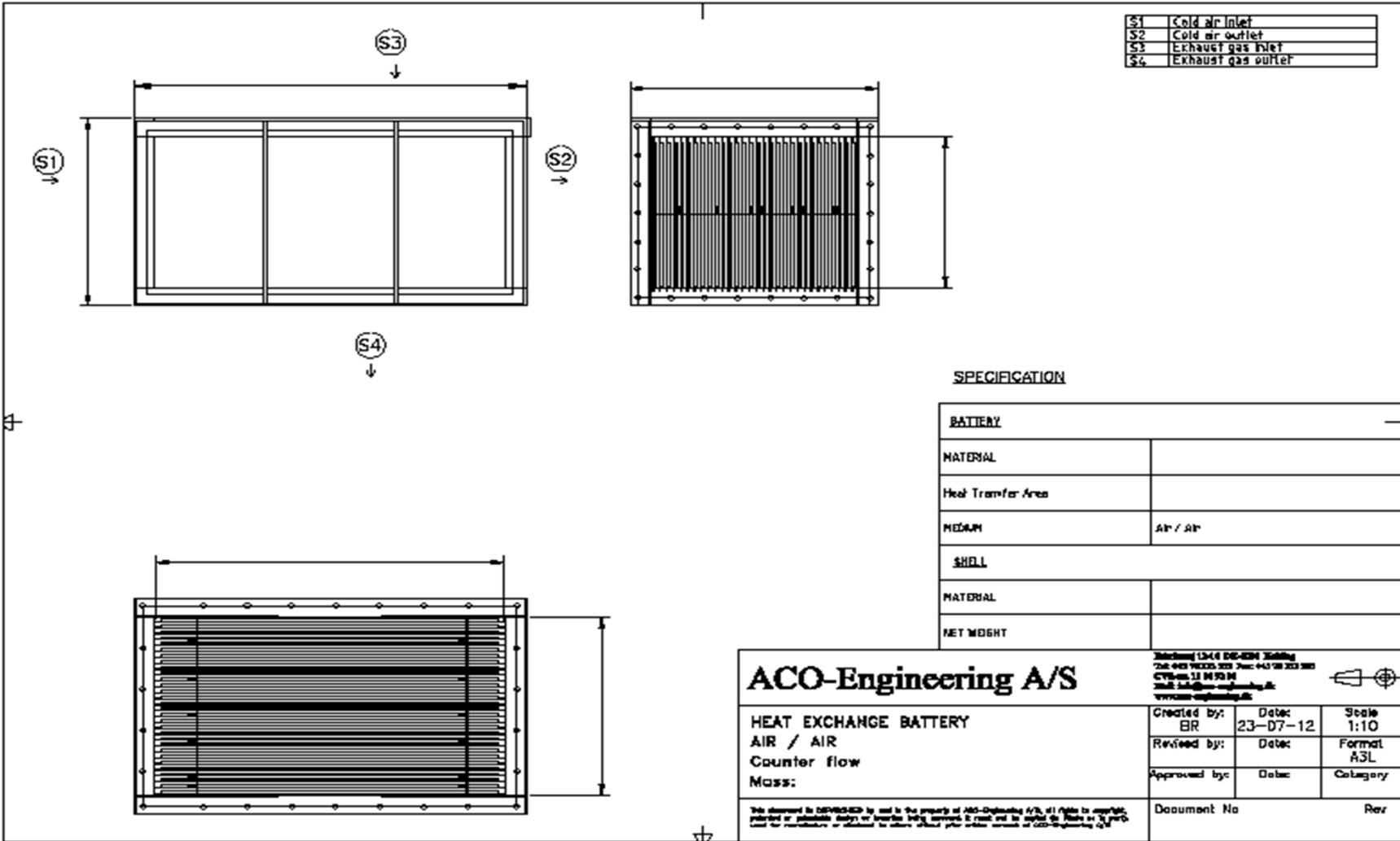
- The flexibility of the design gives various possibilities when finding the right solution to customer's needs and wants.
- Suitable for aggressive air or gases.
- The product has a good ability to handle dust or particle-loaded air or gases.
- Very easy to maintain and clean.
- Upon request a CIP-system can be installed.



AIR to AIR Heat Exchanger: Counter Flow



AIR to AIR Heat Exchanger: Cross flow



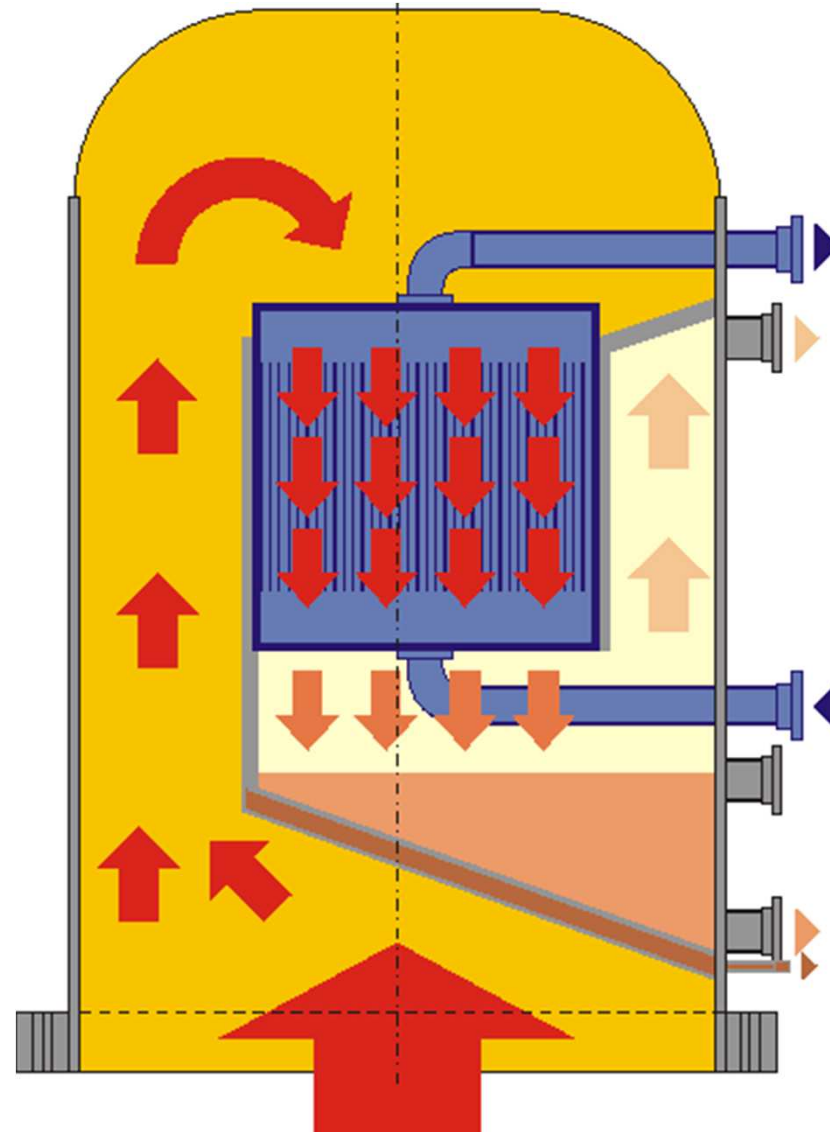
Top Condenser / Condenser



Top Condenser / Condenser

- The top condenser is custom-made so it fits the column diameter.
- For mounting directly on top of a tank or a process column.
- Simple installation, it is also much cheaper to maintain.
- Well suited for large flow amounts, and the drop in pressure is minimal.
- A range of well-tested.
- Known for their sturdiness.
- Ensuring optimum operation and efficiency by using advanced computer calculation programs.

Top Condenser



Process plants

- We provide engineering, manufacturing and assembly of process plants according to the customers specifications – Thus giving **you** the best possible experience and service when trading with us.



ACO Engineerings future prospekts

- Expanding our business with new geographic markets
- Maintaining and increasing our market position as the leading company with various niche products within heat transfer
- Continue developing flexible solutions and compact Design for customers worldwide
- Continuous improvement of our quality standards, efficiency and delivery compliance



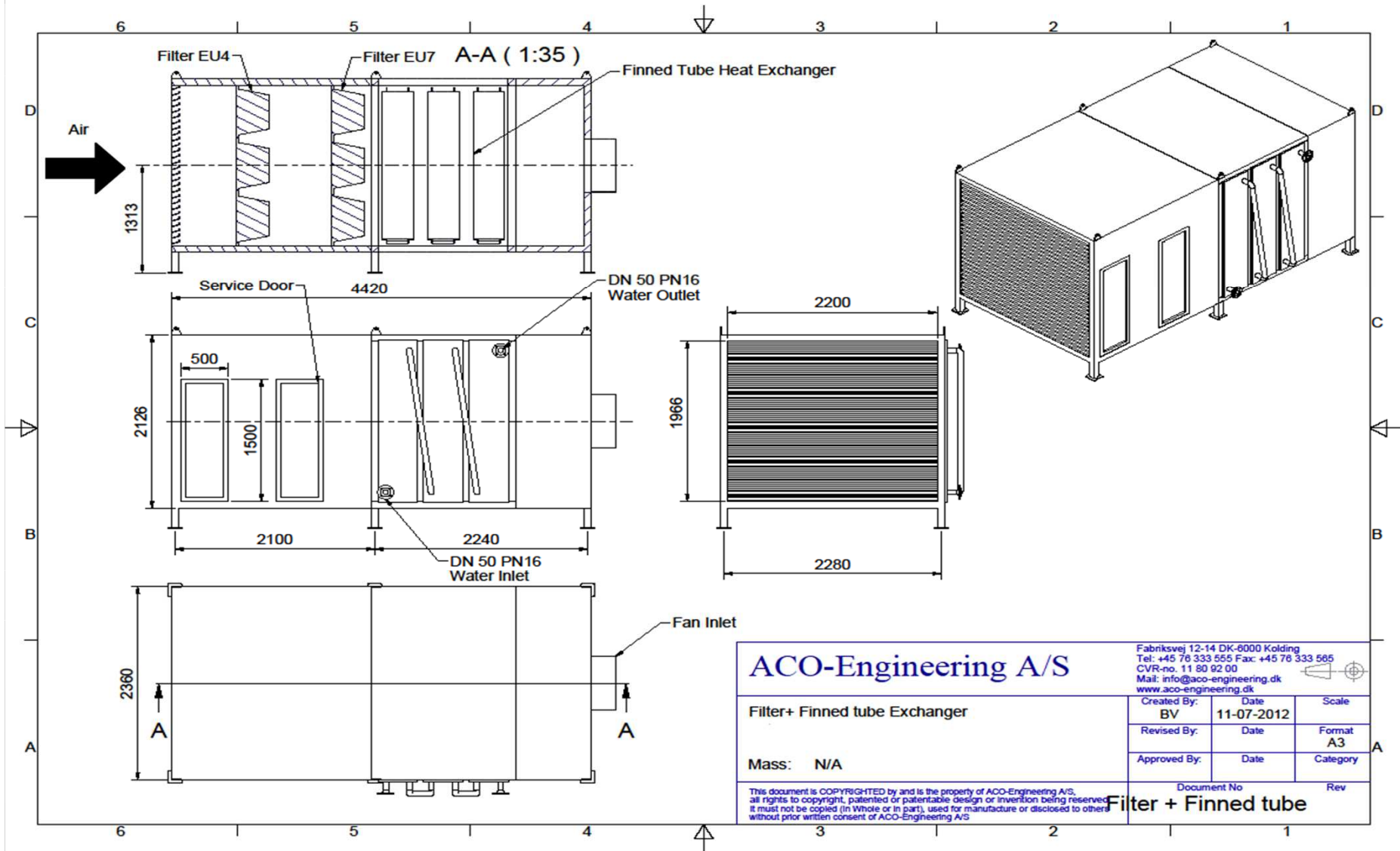
Picture examples: Pressure Tanks



Picture example: Filter Housings



Picture example: Filter Housings



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