Advanced heat transfer technology

ATHCO-Engineering is the global leader in advanced heat transfer technology.
WELCOME TO ATHCO

Since 1947 ATHCO-Engineering has been a frontrunner within the design and manufacture of pillow plates (thermo plates) and customized process equipment.

ATHCO-Engineering has specialized itself in the manufacturing of pillow plates (thermo plates) to be used in thermal processes. The plates are e.g. used in ATHCO-Engineering's own heat exchangers, which have gradually become standard with many clients in the process industry.

Due to ATHCO-Engineering's particular expertise in regard to pillow plates, ATHCO-Engineering is a subcontractor to other manufacturing companies who are using our special designed plates for tanks, heat exchangers etc. A team of constructors develop other sorts of process equipment according to the specifications of the customer. Such equipment is typically process tanks, pressure tanks, etc.

ATHCO-Engineering has a modern production facility, where certified welders, technicians and engineers manufacture products and customer adapted solutions. Furthermore, the production unit carries out subcontractor work in the form of solutions that have been constructed and specified by other suppliers. ATHCO-Engineering has approximately 100 employees.

SPECIAL ACO CUSTOMER BENEFITS:

- Short pay-back period on investment.
- Compact design and simple installation.
- Good thermal operation efficiency due to high transfer coefficients.
- Each heat exchanger is individually designed for the heat load, flow rate and pressure drop limitations of the specific application.
- Self-cleaning effect due to the smooth surface of the thermo plates.
- Fouling tendency is reduced to an absolute minimum, and that also applies to the need for maintenance.
- Energy saving and greener solutions.
Unique transfer characteristics

The pillow-shaped design of thermo plates allows for optimum flow and turbulence, thus providing excellent conditions for efficient heat transfer. A thermo plate consists of two thin plates, which are fully welded along the sides and the ends. In the middle area the thermo plates are covered with a pattern of spot welds, whose interrelated position decides the level of pressure and type of flow.

For certain applications we add extra welding paths in order to control the actual flow through the plates. This increases the velocity of the flow between the plates and alters the heat transfer values.

The welded plates are hydraulically expanded by either water or gas until the required gap is reached. The gap distance has great influence on the level of both heat transfer and pressure drop.

The pillow-shaped design creates excellent turbulence and provides a self-supporting construction. Our thermo plates do not transfers any forces outwards onto the next plate, which would otherwise have to be absorbed by housing pressure plates.

Designed for your specific requirements

In theory the plates can be manufactured in any size depending on the application and the physical space available. The gap to the next plate and the number of plates installed can be varied depending on media, flow rate, pressure drop limitation and total heat load required. In- and outlet connections can be fitted as per customer's request in the size and standard needed for the application.

We design thermo plates for heat exchangers based on genuine counter flow, for parallel and cross-flow and for combinations of the above. Our thermo plates can be built into existing reactor towers or vessels in a process plant. We also deliver complete ready-to-install plate banks built into a box or vessel shaped structure.

Complies with industry-recognised codes

Our engineers currently design to the following industry-recognised codes:

- ASME U stamp
- PED
- AD Merkblätter
- SPVC
- CODAP
- Stoomwezen
- ISO 9001
- China Stamp - Pressure Vessel or the SELO Certificate
This strategy can also be used to boost a refrigeration plant that is not matching the demand as regards peak levels of cooling.

Moreover all ATHCO plate heat exchangers are suitable for applications involving contaminated gases or liquid fluids due to the smooth pillow surface that allows CIP cleaning or manual high pressure cleaning with good results compared with other products on the marked.

The plate geometry can be adjusted to the course of condensation flow, thus making the ATHCO surface condensers a cost effective alternative to conventional tube and spiral heat exchangers.

### Fields of application

The fully welded ATHCO plate heat exchangers are individually optimised for each project in line with technical and commercial consideration for heating, cooling, condensing and evaporation, which make the thermo plates well-suited for Falling Film Evaporators and condensers.

**The plates are very suitable for drying processes such as air pulsation of milk and chemicals.**

An ice bank system is also a good example of use, when you need to store cooling capacity at night for use on the following day e.g. for cooling a building. With such an application you will be able to utilize the advantage of using cheaper electricity produced at night and save it for next day.

### Advantages compared with other types of heat exchangers

<table>
<thead>
<tr>
<th></th>
<th>Thermo plates</th>
<th>Shell and tube exchangers</th>
<th>Gasketted heat exchangers</th>
<th>Spiral heat exchangers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature range, operation</strong></td>
<td>up to 800°C</td>
<td>up to 800 °C</td>
<td>up to 170 °C</td>
<td>up to 350 °C</td>
</tr>
<tr>
<td><strong>Maximum pressure</strong></td>
<td>up to 60 bar</td>
<td>up to 200 bar</td>
<td>up to 32 bar</td>
<td>up to 25 bar</td>
</tr>
<tr>
<td><strong>Comparable K-values in water (kcal/m²h oC)</strong></td>
<td>2200</td>
<td>1700</td>
<td>3500</td>
<td>1200</td>
</tr>
<tr>
<td><strong>Air or gas to water applications</strong></td>
<td>suitable</td>
<td>suitable</td>
<td>not suitable</td>
<td>limited use</td>
</tr>
<tr>
<td><strong>Submerse into tanks or rivers</strong></td>
<td>yes</td>
<td>limited</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td><strong>Weld to tanks and reactors</strong></td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td><strong>Build into existing towers, etc.</strong></td>
<td>very flexible</td>
<td>limited</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td><strong>Fully welded construction</strong></td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td><strong>Applies to heavy polluted liquids/gasses</strong></td>
<td>yes</td>
<td>yes</td>
<td>limited</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Weight compared with area</strong></td>
<td>low end</td>
<td>high end</td>
<td>low end</td>
<td>high end</td>
</tr>
<tr>
<td><strong>Falling film, condenser and evaporators</strong></td>
<td>suitable</td>
<td>suitable</td>
<td>limited</td>
<td>limited</td>
</tr>
</tbody>
</table>
AN OPEN AND FLEXIBLE APPROACH

“Sulzer GmbH in Switzerland has cooperated with ATHCO-Engineering during the last 12 years. At Sulzer quality is an important parameter, and we have been very satisfied with the uncompromising quality ATHCO-Engineering has delivered to us. Besides that, we experience an open and flexible approach to solve every new task”.

Herr Michael Schneider
Sulzer GmbH

A POSITIVE CONTRIBUTION TO THE DEVELOPMENT OF OUR PRODUCTS

“GEA has in many years worked closely together with ATHCO-Engineering. We especially find the daily co-operation and exchange of knowhow as well as information important. This exchange of knowledge and expertise is in the nature a partnership, which contributes positively to a continuous optimizing and development of our products.

Their modern and presentable production facilities, special qualifications and experience with our products makes ATHCO-Engineering to an important collaborator for GEA Niro”.

Henrik Bo Petersen
Deputy Division Manager at GEA Niro
### Process Therm

**Process Therm** is a heat recovery system, which allows the reuse of the energy in discharge air to ensure a lower consumption of energy.

Process Therm is to be installed into the actual discharge channel. With its fully integrated CIP system it is well suited for dust loaded air. Recovered energy is transported directly to the pre-heater, where it is used to pre-heat incoming air. The compact design with an average ratio of 150 – 200 m² heating surface per m³ volume lets you integrate Process Therm in practically all existing plants. All in all Process Therm ensures fast breakeven and continues to ensure a significant CO₂ reduction.

### Therm-X

**Therm-X** is a self-cleaning heat exchanger specially designed for heat recovery, cooling and heating of fibre-contained or contaminated process liquids.

It consists of concentric thermo plates that are continuously cleaned with attached brushes. The continuous cleaning ensures optimum efficiency as the dirt is kept at a minimum. The brushes make sure that particles do not stick onto the thermo plates, and are thus vital for improving the life time of the product.

The heat exchanger can be used with a range of cooling/heating media like steam, water and ammonia.

The heat exchanger is built as a vessel and thus allows for heat exchange in situations, where the process fluid flows in an uneven steam or even stops for shorter or longer intervals.

### TP HEX

**TP HEX** is manufactured in all sorts of cold-worked materials.

The biggest advantage of TP HEX is the longitudinal shape with flows on both sides as they have a highly positive effect on the thermal efficiency. The narrow channels of TP HEX results in a very small hydraulic diameter, which together with the shape of the thermo plates, helps create the desired turbulence. The heat transfer in TP HEX is better than in regular tube heat exchangers, where part of the available drop in pressure is used to reverse the flow around the baffle plate.

Another advantage is the small space between the plates, which results in a compact design with a large heat transferring surface per m³ volume. This is especially valued at existing plants, where the floor space may be limited.

### Condensers

At ATHCO-Engineering we design and manufacture a variety of well-tested condensers built on years of improvements and optimisation.

Our condensers apply for a wide range of processes and are known for their sturdiness. We supply condensers in stainless steel, SAF 2205, SMO, and other high alloy materials.

Our condensers are among others used as top condensers in distillation plants and exhaust gas condensers in combustion plants.

### AIR to AIR Heat Exchanger

**AIR to AIR Heat Exchanger** is due to its construction in stainless steel or higher alloy materials suitable for aggressive air or gasses.

The free distance between the plates on either side will be adjusted to fit the duty. In theory the overall size of each unit can vary from small to very large depending on the space available on site.

The big advantage of the Air-to-Air Heat Exchanger is its ability to handle dust or particle-loaded air or gasses, which normally get stucked inside exchangers with closed fins.
### Fields of application

**All processes with the presence of large amounts of dust in the discharge air.**
- Food processing plants
- Chemical plants
- Wood and paper processing plants
- Textile industry
- And similar processes

**In large shower rooms you would be able to transfer probably around 15 °C from the drain to the fresh water in order to save energy and money.**
- Swimming pools
- Public bathrooms
- Sewage water plants
- Textile
- Paper
- Laundry washing
- And other similar processes

**With a few adjustments TP HEX is the perfect match for a wide range of uses within liquid and gas heat transfer.**
- Coolers
- Heaters
- Heat transfer
- Condensers
- Reboilers
- Evaporators

**Applicable as top condensers in distillation plants and exhaust gas condensers in combustion plants.**
- Power stations
- Chemical process plants
- And other similar processes

**Especially suitable for heat recovery of aggressive air or gasses.**
- Chemical industry
- Food industry

### Product advantages

- Maintenance-free in dust loaded air
- No expensive stops as cleaning takes place during production
- Delivered with built-in CIP system
- Usable for vacuum up to 100 mbar
- Heat recovery with constant condensation
- Various high alloy materials can be used to obtain long life time

- Self-cleaning unit with brushes with an adjustable speed of rotation
- Highly efficient due to the movement of the brushes, which create better turbulence and thus increased efficiency
- Easy to inspect
- Available in various steel qualities
- Variable volume of vessel and number of rings depending on the application

- Low maintenance due to self-cleaning surface and a structure without seals
- Up to 3 times smaller than a tube heat exchanger
- Efficient heat transfer due to large contact surfaces
- Low fouling tendency due to optimum turbulence
- CIP-system upon request
- Also available with a fixed bank
- Endures larger pressure than seal based heat exchangers

- Robust design
- Easy to clean
- High efficiency

- Applicable for dust or particle-loaded air or gasses
- Suitable in aggressive atmospheres
- Suitable for high temperatures
- Both sides can be cleaned manually or by CIP
The core business of ATHCO-Engineering is to design and manufacture tailor-made equipment for the process industry. At our premises 100 kilometres north of the German border we reside in a 10,000 m² modern production facility with various welding and laser cutting machinery.

As we are often called upon to address unusual and challenging designs, we have become one of the leading specialists within thermal designing and manufacturing of plates for heat exchangers.

During our 30 years of business we have built up a unique expertise within the following industries:

- Food and dairy
- Textile
- Chemicals
- Paper and pulp
- Sewage water
- Powder drying
- Flue gas heat recovery
- And many more

For more information feel free to contact us

ATHCO-Engineering

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