Brazed plate heat exchangers

Concentrating on competence – for your benefit

Within the GEA Process Equipment Division of the international GEA Group GEA PHE Systems stands for focussed competence in plate heat exchanger technology. Strong individual companies: GEA Ecoflex for gasketed and fully welded plate heat exchangers, GEA Ecobraze, GEA WTT and GEA PHE Systems North America for brazed plate heat exchangers – offer tailor-made customer solutions for just about every possible application. GEA EcoServe – the service organisation of GEA PHE Systems – provides a fast and competent maintenance and spare parts service with customer service centres in many countries.

At the company headquarters in Sarstedt, near Hannover, GEA Ecoflex produces gasketed and fully welded plate heat exchangers. Centres of competence for brazed plate heat exchangers are GEA WTT in Nobitz-Wilchwitz (Germany), GEA Ecobraze in Landskrona (Sweden) and GEA PHE Systems North America in York (USA), where brazed plate heat exchangers are also produced at a state-of-the-art manufacturing facility.

State-of-the-art technology and decades of experience based on successful applications guarantee highest quality, cost efficiency and reliability. OEMs, plant engineering companies and end users count on our comprehensive competence in offering tailor-made solutions and rely on the backing of a major international group of companies.

GEA PHE Systems:

- Convincing engineering and process know-how
- Pioneering technology
- Global presence
- Competent consulting and service

Process Equipment

GEA PHE Systems

Gasketed-free engineering for all applications

Brazed plate heat exchangers are made up of an individually defined number of high-quality embossed special steel plates that are permanently joined in a special vacuum brazing process using either copper or nickel. They are hermetically sealed without gaskets and can therefore handle the highest operating pressures and temperatures.

During assembly every other plate is rotated by 180 degrees in the plane to produce two separate flow channels in which the products involved in heat transfer flow in counter flow.

The plate contours generate a highly turbulent flow allowing efficient heat transfer even at low volumetric flows. This prevents any soiling of the heat exchanger and non-flow zones are completely separate.

The surface of the brazed plate heat exchanger is utilised almost completely for heat transfer, and this makes the unit extremely space-saving and cost-effective.

Brazed plate heat exchangers from GEA PHE Systems

- Practically maintenance-free, due to lack of gaskets
- Simple assembly with individual connection design
- Highest operational reliability thanks to comprehensive quality assurance testing
- High resistance to pressure and temperature
- Compact design combined with low weight

Thanks to their unique design the potential fields of application for brazed plate heat exchangers are continuously on the increase: From air conditioning, process cooling and industrial refrigeration through building engineering, heating and power engineering right up to plant engineering, automotives and industry – wherever you look, you'll find brazed plate heat exchangers from GEA PHE Systems in use!

Well designed – down to the smallest detail

To keep your planning flexible we provide the widest range of brazed plate heat exchangers to meet the performance requirements of modern heating, refrigeration and air conditioning systems, offering an impressive variety of circuit variants and applications.

Customer-specific solutions without restrictions coupled with a wide standard range. And this wide selection means you will always find the correct connection for your specific needs.

Our competence is your advantage

We have developed our own sizing software for end users to enable them to immediately find the most suitable model to suit their specific requirements from our wide range of heat exchangers. The software immediately finds the optimum plate heat exchanger for your purposes.

And if you require a meeting to discuss matters, then our application and sales engineers are always there to provide you with the necessary advice and assistance.

Quality in development, design and manufacture

The complete manufacturing and logistics process is performed in compliance with DIN EN ISO 9001: 2000. Our innovative and cutting-edge equipment meets all accepted international standards, directives and classifications such as CE/PED, UL, ASME, KIWA etc.

Our competence is your andvantage

Automated pressing lines for

- low-cost manufacturing processes
- demand-oriented just-in-time production

Computer-controlled, high-precision testing stands for

- quality assurance to ensure compliance with DIN EN ISO 9001: 2000
- adherence to close tolerances

Computer-controlled brazing processes to

- ensure quality
- guarantee secure connections

Demand-oriented warehousing for

- short delivery times
- up-to-date range

Always the suitable solution at hand

The most common solder used in brazed plate heat exchangers is copper. Copper provides the highest processing quality and resistance to pressure and is highly cost-effective. Copper is resistant to most media and is always the material of preference. It can be combined with various stainless steel plate materials.

WP and GB – our copper-brazed ranges

The brazed plate heat exchangers of the WP standard range can be supplied in all special designs. These have proved their worth in the pressure range up to 40 bars and offer a maximum variety of circuit possibilities. The new GB range offers an optimised corrugation pattern in the wave fields of the heat exchanger plates as well as further improvements to the inlet and outlet openings.

The Special Designs…

AE – Advanced Evaporator

The patented refrigerant distribution system of our Advanced Evaporator range was specially developed for evaporation applications. The AE provides an equal distribution of the refrigerant across the wide number of flow gaps, thus guaranteeing highest evaporation performance. The system is made of stainless steel and is fully integrated into the refrigerant inlet of the heat exchanger. Suitable for both dry and flooded evaporation. **Solder: copper or nickel**

DW –Double-walled

Double-walled heat exchangers are fitted with two walls, rather than one, to ensure safe separation of the channels. Even in the event of an internal breakthrough no mixing of the media occurs. **Solder: copper**

HP – High-Pressure frame

The HP series uses an external pressure-bearing frame to reach higher pressures. Condensers and economisers for ammonia applications in conjunction with nickel solder.
Solder: copper or nickel.

TD – True-Dual heat exchangers

True-Dual – the dual-circuit evaporator or condenser for constant high efficiency. The TD provides this optimum performance even when only one refrigeration cycle is in operation. It comprises two independent refrigeration circuits and a water/brine circuit. **Solder: copper**

XCR – eXtended Corrosion Resistant

Our XCR models are typified by their increased resistance to corrosion in chlorine-loaded environments. The plates are made of a high quality stainless steel material, SMO 254 (1.4547).
Solder: copper or nickel

Where copper does not offer sufficient resistance in extrapure water applications (demineralised water, etc.) or in corrosive liquids, nickel is often chosen by users as the solder. Offering all advantages provided by a copper-brazed plate heat exchanger, the only visible external difference is the silver-coloured surface. But our nickel solder is not your run-of-the-mill nickel solder. Only around 75% is pure nickel, and the remaining 25% is our secret – and your advantage.

NP and GBN – our nickel-brazed ranges

Nickel is the solder used for the brazed plate heat exchangers in our NP standard range. In the pressure range up to 16 bars (27 bars with special HP design) it provides all of the properties offered by our copper-brazed products. The GBN range with the properties of the new GB range is under development and will be available in the near future.

AP – Air Plate dryers

Plate heat exchangers for refrigerating compressed air dryers were specially developed for efficient air/air and air/refrigerant heat exchanging applications. Various models and design sizes allow a system with separate or integrated condensate collection in all standard performance classes. **Solder: copper**

OC – Oil-Cooler

Specially designed plate heat exchanger for oil and hydraulic cooling. The OC series provides reinforced flange plates, either with SAE standardised connectors or internal thread. **Solder: copper**

...and their convincing features

Plate design

The special plate design allows optimum heat transfer and therefore the largest possible degree of efficiency for your application. Larger contact points result in stronger braze joints between the plates, thus guaranteeing high apparatus pressure strength.

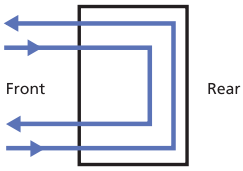
Full-Flow system™

The Full-Flow system™ was developed to counter freezing problems of the flow channels and the resulting risks of system failure when brazed plate heat exchangers are used as evaporators in refrigeration plants. It guarantees optimum circulation around the connections, with effective prevention of any port freezing.

Safety Chamber™

The patented Safety Chamber is the ultimate in large brazed plate heat exchangers. Encapsulated contact points take up the forces in the connection zones. If these contact points are overloaded and the material cracks, then penetration through to the other medium is prevented - a great safety factor for any plant operator.

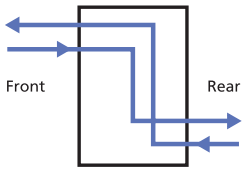
Increased possibilities thanks to circuit diversity



Standard design model

All standard applications

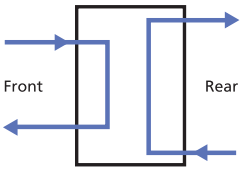
Flow control _ one-way



Z circuit design

Rearside connections for easier installation

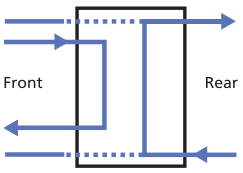
Flow control _ one-way



X circuit design

Reciprocal connections
Rearside connections for easier installation

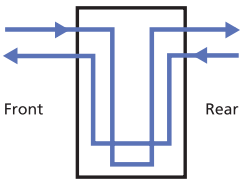
Flow control – one-way



Reciprocal connection with additional sensor connections

Preferred variant for heat pumpswith sensor connections

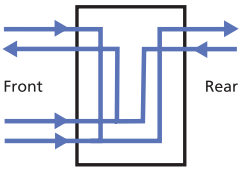
Flow control _ one-way



U-design

Multi-pass applications with higher thermal length

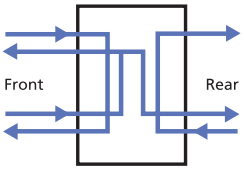
Flow control - two-way



DS design

Variant for two-stage service water heating with preheater and afterheater in a single unit

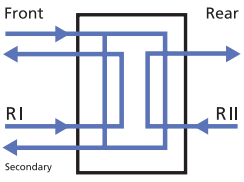
Flow control _ two-way



TIO design

Combination plate heat exchanger
Variant for combined heating and service water heating in a single unit

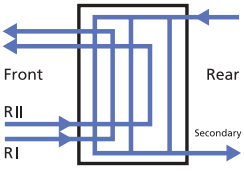
3-media heat exchanger



DUO design two-circuit plate heat exchanger

Variant for connecting two refrigerating circuits in back-to-back arrangement

3-media heat exchanger



TD design True-Dual

Variant for connecting two refrigerating circuits in two-circuit channel arrangement to improve partial load behaviour

3-media heat exchanger

Standard fittings for all plate heat exchangers

Wrapped up tight: with insulation engineering

Built for strength: floor bracket and transport hook

Quick links: the screwed counter-connections

- COMPAC™ flange system ND 65 to ND 100, complete with counterflange
- Welding-neck flanges to DIN 2635
- Screw connections, butt welded / butt brazed / external thread
- Permanent, factory-fitted heat and cold insulating PUR rigid foam insulation
- Heat-insulating shells made of PUR rigid foam
- Cut-to-shape cold insulation of NBR material, diffusion-tight, comprising front cap, end cap and jacket – provided with adhesive layer. Thickness: 10 mm or 20 mm
- Floor bracket and transport hook to suit all larger units
- Combined floor-wall brackets for smaller units
- All WP10 models are factory-fitted with bracket and transport hook
- Welded-on threaded stay bolts for holding and fixing
- Measuring sensor socket for temperature monitoring (1/2" internal thread)

COMPAC™ – flange

Our references

Two WP525M-24 used in a high-performance brine/water heat pump (5-26 kW). The direct evaporator uses the environment-friendly refrigerant R407c, providing energy-saving heating and hot water supply throughout the year. With their thermal efficiency and individual reciprocal connection possibilities our plate heat exchangers offer maximum compactness.

GEA WTT plate heat exchangers – with either copper or nikkel brazing – supplement solar heating engineering with their high thermal performance even in the smallest space. With environment friendly solar energy warm drinking water and heating water can be generated with no loss.

GEA Ecobraze foam-clad plate heat exchangers have demonstrated their efficiency in district heating systems. With the factory-fitted heat insulation GEA Ecobraze has achieved a cost-effective and energy-saving solution.

Combined heating and power stations are compact units where a diesel, gas or biogas engine drives a generator. The heat contained in the cooling water and exhaust gases of the engine is used for heating purposes. Cooling of the engine cooling water is done by GEA Ecobraze plate heat exchangers. Thanks to their high overall energy utilisation factor combined heating and power stations are cost-effective measures providing also climate protection.

Perfection in detail for a wide range of applications

GEA PHE Systems
Competence in Heat Transfer

Within the GEA Process Equipment Division, GEA Ecoflex together with GEA Ecobraze, GEA WTT, GEA PHE Systems North America and GEA EcoServe forms GEA PHE Systems, the centre of competence and service for gasketed, brazed and fully welded plate heat exchangers in the following fields of application:

- HVAC
- refrigeration
- sugar
- chemical
- paper
- food
- life science
- marine
- power
- renewable energy

Argentina
Australia
Austria
Brazil
Bulgaria
Chile
China
Croatia
Czech Republic
Denmark
Dubai
Estonia
Finland
France
Germany
Great Britain
Greece
Hungary
Iceland
India
Indonesia
Iran
Italy
Japan
Korea
Malaysia
Netherlands
New Zealand
Pakistan
Philippines
Poland
Romania
Russia
Singapore
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Slovenia
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Venezuela
Vietnam

Contact details at:

www.gea-phe.com

Your contact:

GEA

Process Equipment

GEA Ecoflex GmbH
Karl-Schiller-Str. 1–3
31157 Sarstedt · Germany
Phone: +49 (0) 50 66 / 601 - 0
Fax: +49 (0) 50 66 / 601 - 104
www.gea-ecoflex.de
E-mail: info@gea-ecoflex.de

GEA WTT GmbH
Remsaer Straße 2a
04603 Nobitz-Wilchwitz · Germany
Phone: +49 (0) 34 47 / 55 39 - 0
Fax: +49 (0) 34 47 / 55 39 - 30
www.geawtt.com
E-mail: sales@geawtt.com

GEA Ecobraze AB
Stuverigatan 5
26 135 Landskrona · Sweden
Phone: +46 (0) 418 446 - 160
Fax: +46 (0) 418 446 - 177
www.gea-ecobraze.se
E-mail: info@gea-ecobraze.se

GEA PHE Systems North America, Inc.
100 GEA Drive
York, PA 17402 · USA
Phone: +1 / 717 / 268 - 62 00
Fax: +1 / 717 / 268 - 61 63
www.geaphena.com
E-mail: info@geaphena.com