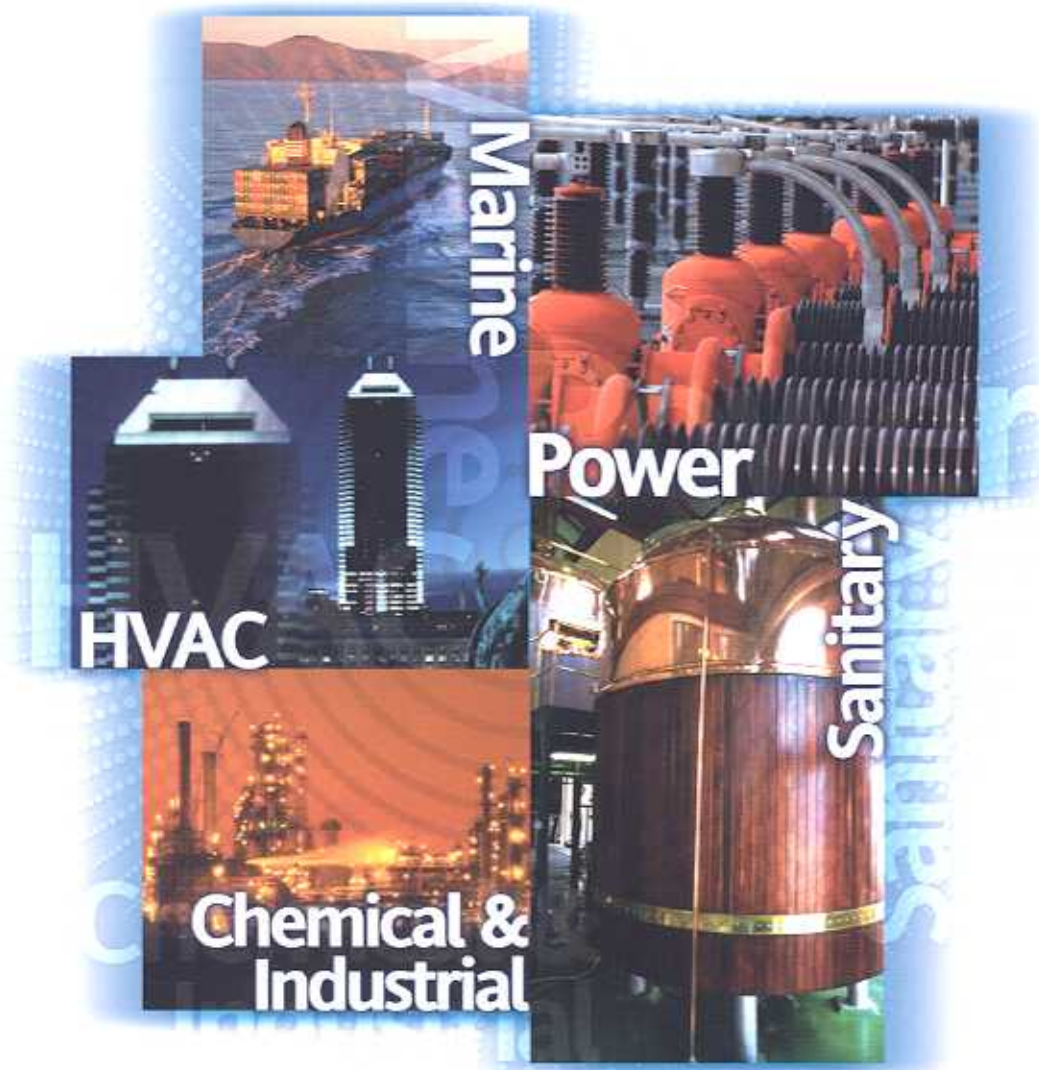


APV PARAFLOW® Plate Heat Exchangers



... applying our history of
Applications,
Products and
Value in delivering
today's solutions

A history of excellence, innovation and expertise

A look back. And forward.

For more than 75 years, APV Systems has provided customers worldwide with the latest technology, process equipment and engineered systems. APV also offers the special ingredients of integrated "process-to-boardroom" automation and services. APV is world renowned for state-of-the-art technology, unsurpassed process knowledge, and an unwavering commitment to our customers.

APV has evolved and grown over the years to better meet the changing needs of our customers and their industries. The first commercially successful plate-and-frame heat exchanger was introduced in 1923 by the Aluminum Plant and Vessel Company Ltd., which became known as APV. The first Paraflow Plate Heat Exchanger, constructed of cast gunmetal plates and enclosed within a crude frame, set the standard for today's computer-designed thin metal plate.

Our vision for the future is rooted in a long standing tradition of excellence



APV founder: Dr. Richard Seligman

and commitment to progress. We strive to offer the customer the highest quality products and services today, tomorrow and beyond.

Delivering products of unparalleled quality and performance.

Every APV plate heat exchanger is thoroughly tested prior to shipping to your facility. Stringent standards ensure your heat exchanger will deliver reliable

service, even under the most severe operating conditions. Our quality personnel work hand-in-hand with research and development, continually striving to make improvements to PHE designs.

Our experience, diversity, and capabilities enable us to meet the rapidly changing needs of the many industries we serve. With APV you can count on the best possible products for your applications.

Unmatched process knowledge ensures solutions that are right for you.

Name the process. Name the product. Our experts have already developed, installed, and supported a similar solution. Through an extensive database, all information regarding various installations are accessed and applied for developing solutions in a timely manner. With APV you can be confident that you will get a solution that will meet your needs.

Sanitary

**Chemical
& Industrial**

**HVAC /
Refrigeration**

Power

Marine

Key components of the plate heat exchanger

Frame

A rigid structure that holds the plate pack in alignment and maintains gasket compression, providing a proper seal.

Frame Components

- Head and Follower
- Top and Bottom Carrying Bars
- Tie Bars
- End Support

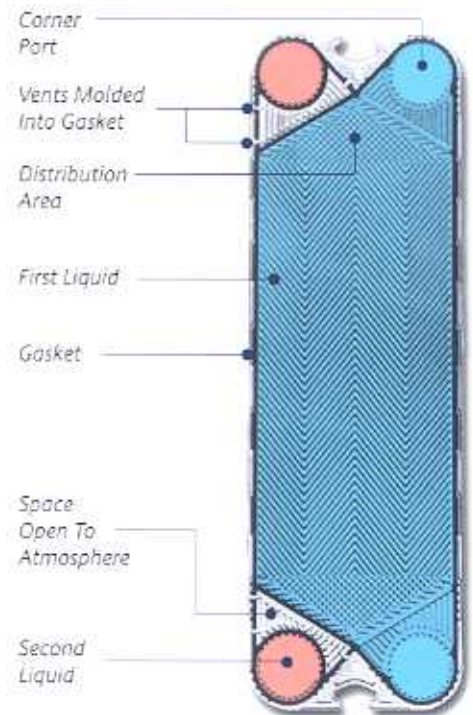
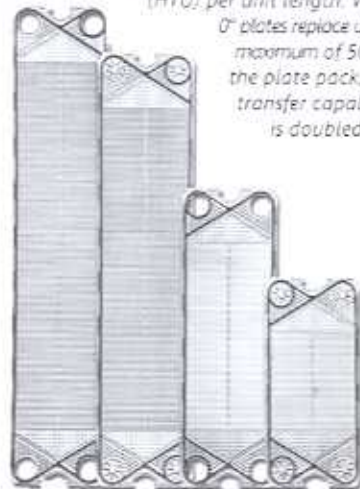
Plate Pack

The plate pack is the heat transfer surface consisting of a series of formed metal plates compressed between the head and follower of the frame.

- Corner ports allow passage of the hot and cold liquids between the plates
- Molded gaskets along the plate edge and around the ports prevent leakage and fluid intermixing
- Wide range of corrugation patterns and plate thicknesses for optimizing thermal length and efficiency
- Combining plates that have a variety of corrugation angles induces greater turbulence at lower flow rates and creates a high film coefficient
- In-phase corrugation patterns available for applications with fluids containing particulates
- Materials of construction are selected based on compatibility with fluids and temperature
- Single and multiple-pass configurations selected based on process requirements, multi-fluid configurations are also available



By combining mixing plates pressed with different corrugation angles within a single heat exchanger, significantly different flow passages are created. For example, plates with a 50° corrugation angle to the horizontal have a fixed level of thermal performance (HTU) per unit length. When 0° plates replace up to a maximum of 50% of the plate pack, heat transfer capability is doubled.

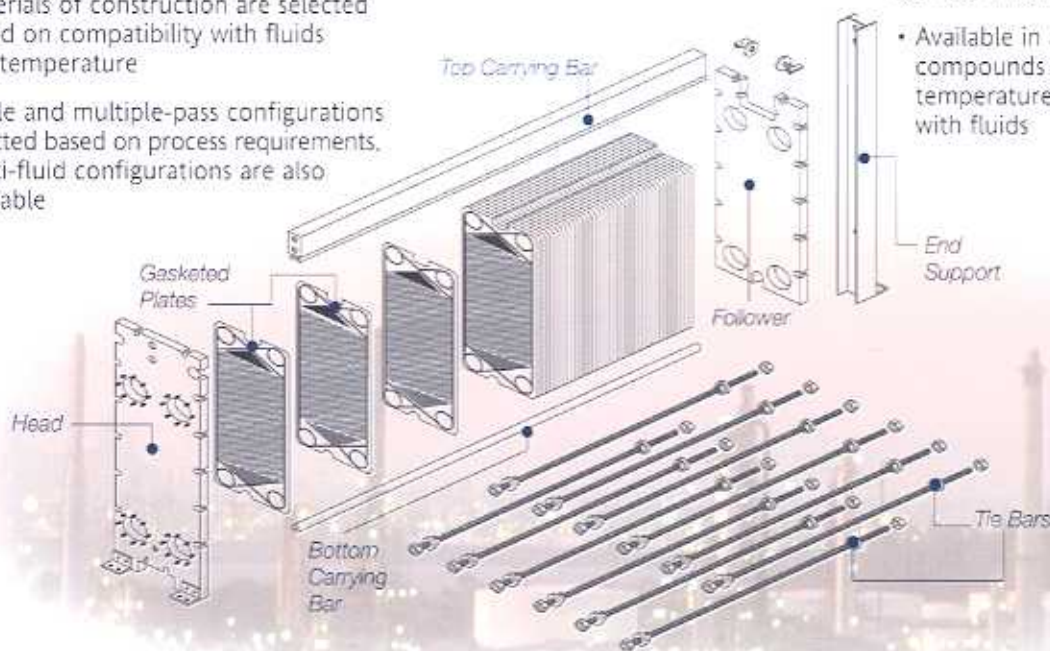


The space between double gasketing around port areas is vented to the atmosphere to prevent cross contamination between fluids.

Gaskets

Molded gaskets in the through-port area of the plate provide a double seal between the fluid streams and prevent intermixing. Gaskets in the groove around the perimeter of the plate seal the fluid between the plates.

- Available in a variety of material compounds depending on temperature and compatibility with fluids



Unique designs from APV

APV Duo-Safety Plate Heat Exchanger

APV's Duo-Safety Plate System provides you with exceptional protection against fluid intermixing that occurs during a plate failure as leaks are forced outside the heat exchanger. This patented product consists of two independent weld-free plates simultaneously formed as a mated pair. Every plate pair is fitted with a non-glued Paraclip gasket to seal the pair together.

Other advantages include:

- 100% visual inspection
- Easy dismantling of plate pairs for thorough cleaning of both sides of the plate
- Flexibility to use differing plate and gasket materials in one pair, such as stainless steel/titanium and EPDM/Viton

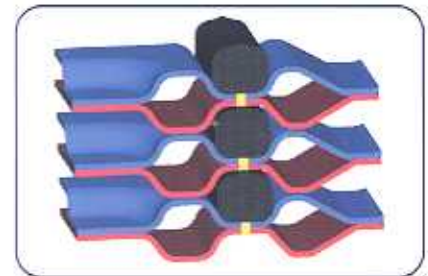
Welded Plate Pairs

APV's laser-welded plate pairs for refrigerant and chemical processing are part of our extensive plate range, and are the logical alternative to shell and tube and all-welded plates.

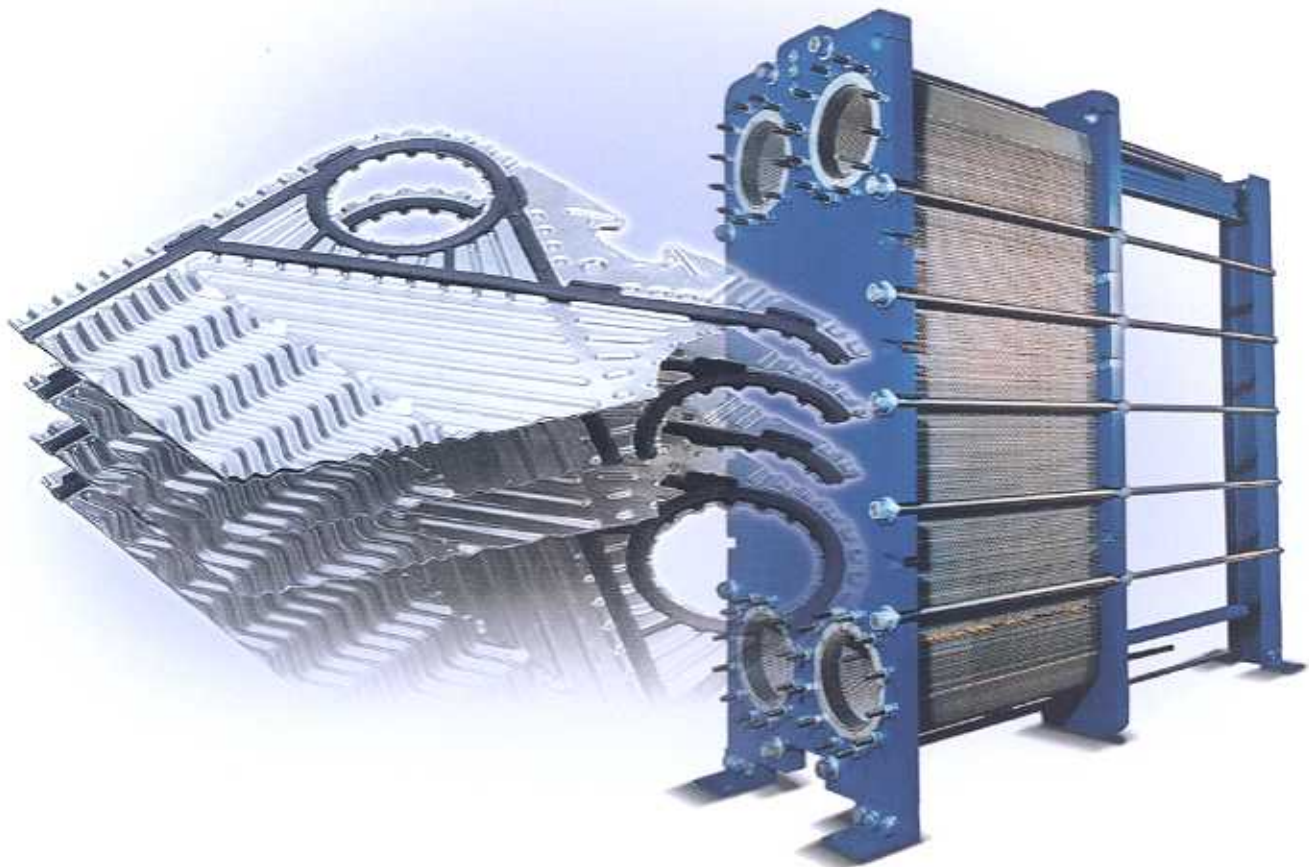
The pairs are particularly suitable for evaporation and condensing of refrigerants such as ammonia and freon, as well as chemical and general process duties involving aggressive liquids that would attack conventional gaskets. Laser-welded plates offer added security against leakage, the flexibility to be expanded or reduced in size, a small footprint and a low profile.



Sealing Detail – Duo-Safety Plate Pair



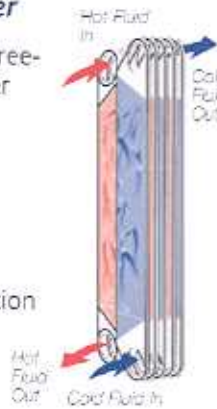
Sealing Detail – Laser-Welded Plate Pair



Advantages of plate vs. tubular heat exchangers

High Heat Transfer

- Film coefficients three- to five-times greater
- Efficient operation with up to 95% heat recovery or regeneration
- Low liquid hold-up enables faster reaction times to change in process
- Fluids flow counter-current to each other between the parallel passages in each pass



- Reduced capital costs and installation expenses
- Saves you time and money on maintenance
- High energy recovery reduces energy costs

Cleanability

- Efficient design of heat transfer area reduces fouling caused by dirt and debris
- Simplified cleaning and plate accessibility
- Designed for use of effective CIP, removing of chemical films or scaling deposits

Accessibility

- Full access to both sides of the heat-transfer surface for inspection, maintenance, and cleaning
- Access is readily accomplished within the installed space of the unit

Flexibility

- Modular design enables expansion of your heat exchanger as process requirements grow
- Handles multiple duties and fluid streams in a single unit
- Easily reconfigured to meet changing process needs
- Wide variety of sizes and styles ensuring optimal solutions for your applications

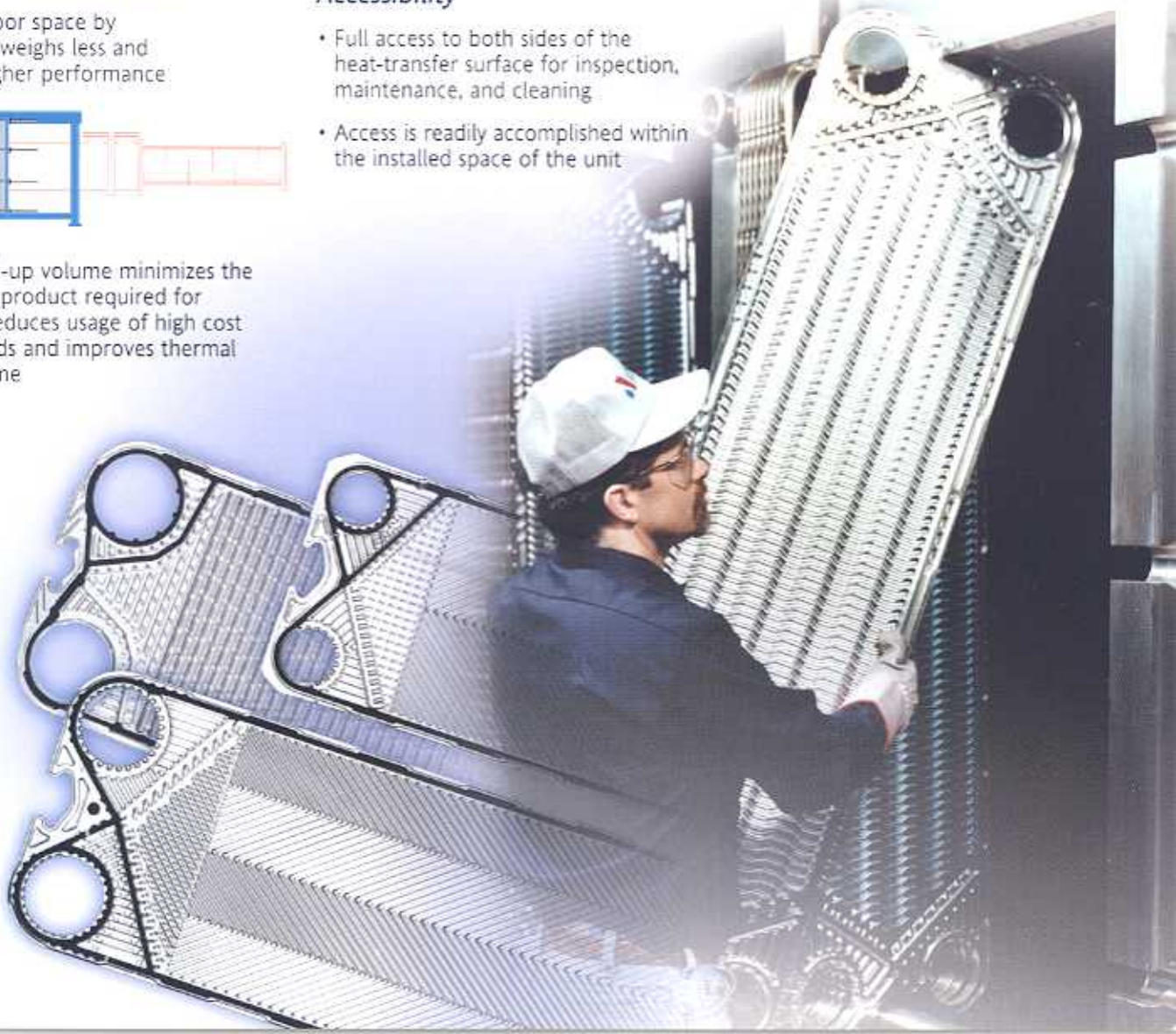


Economical and Compact

- Reduces floor space by up to 90%, weighs less and delivers higher performance



- Lower hold-up volume minimizes the amount of product required for flooding, reduces usage of high cost service fluids and improves thermal reaction time



Committed to your needs — before, during, and long after the sale

Should you require service, our skilled service technicians are available to make on-site repairs — or simply send your plates to one of our strategically located service centers.

To further meet your needs, we offer a wide variety of services, as well as Plate Heat Exchanger Maintenance Service Agreements customized for your needs:

- Regasketing – clean, test, and install gaskets to ensure gasket integrity and maximize heat transfer efficiency
- Plate Exchange Program – minimize downtime by ensuring replacement plates at the customer site prior to taking the unit off line

- Testex – plate integrity analysis – determines the integrity of the plates without disassembling the heat exchanger
- On-site training seminars – installation, maintenance, and operation instruction for plate heat exchangers, homogenizers, pumps, valves and more to optimize the performance of your plant

We are committed to meeting your needs. To learn more about APV services, call us today at 1-888-278-4321.



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