

HEAT EXCHANGERS

Maximize Thermal Efficiency with LaZerWeld Plate Heat Exchangers For Industrial Refrigeration



Frick[®]
BY JOHNSON CONTROLS

Frick Quality Heat Exchanger Solutions

Proven Technology

LaZerWeld Plate Heat Exchangers are in successful operation in a variety of applications for the food, dairy, beverage, pharmaceutical, chemical, industrial, HVAC, and power markets and widely accepted in the industrial refrigeration market.

Components of the energy intensive refrigeration cycle are changing rapidly to maximize the commercial payback and thermal efficiency. Frick fulfills this need for efficiency with our LaZerWeld Plate Heat Exchangers. They have proven reliability and high performance as both evaporators and liquid cooled condensers.

The Refrigeration Processes

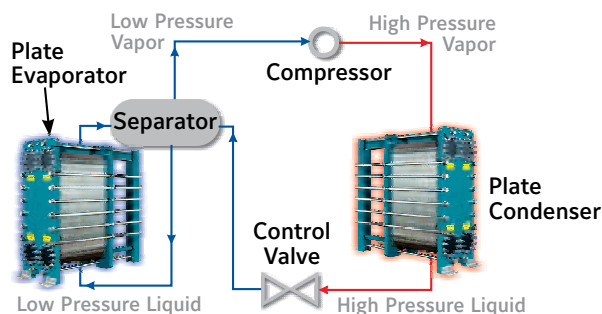
LaZerWeld Plate Heat Exchangers are used in a number of different refrigeration applications. They can function as:

- Flooded Evaporators
- Direct Expansion Evaporators
- Liquid Cooled Condensers
- Desuperheaters
- Subcoolers
- Oil coolers

Flooded Evaporation

A flooded evaporator has liquid refrigerant, at its saturation point, fed into the LaZerWeld Plate Evaporator. The heat from the fluid being cooled causes the refrigerant to boil in the heat exchanger. In most cases, the basic system uses gravity to feed the refrigerant from a separator vessel and the differences in density of the two phase refrigerant causes it to flow through the heat exchanger and return to the separator. This is referred to as a natural recirculation or thermosyphon system.

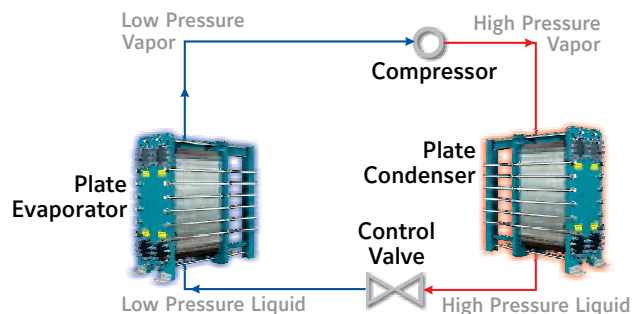
The LaZerWeld Plate Condenser cools and condenses the high pressure superheated vapor back to a liquid.



Direct Expansion Evaporation

In a direct or dry expansion system the refrigerant is fed directly to the LaZerWeld plate heat exchanger without the use of a separator. Although theoretically a dry expansion evaporator may have a lower coefficient of performance, one can normally compensate for this by adjusting the heat transfer area and thus keep the system design simple with a significantly lower physical height.

The choice between such a system and the flooded system is driven by economics and technological suitability, except where a particularly close temperature approach rules out dry expansion. The dry expansion system offers a lower cost and a lower system refrigerant charge. A vast majority of current LaZerWeld plate heat exchanger installations are flooded although use of dry expansion is increasing with the arrival of newer more reliable technology.





FRICK MODEL	CONNECTION SIZE (Inches)	NOMINAL LIQUID FLOW (GPM)*	LENGTH (Inches)	WIDTH (Inches)	HEIGHT (Inches)	NOMINAL CAPACITY (Tons)*
LZW-115	2	250	67	16	42	115
LZWX-115	2	250	67	16	42	105
LZW-400	4	800	81	23	59	400
LZW-650	6	1500	50	24	65	650
LZW-900	8	3000	126	32	85	900
LZWX-900	8	3000	126	32	85	800
LZW-1300	8	3000	126	32	102	1300
LZWX-1300	8	3000	126	32	102	1200
LZW-1800	8	3000	126	32	119	1800
LZW-1100	12	7000	210	39	81	1100
LZW-1900	12	7000	210	39	93	1900
LZW-2500	12	7000	210	39	109	2500
LZW-3100	12	7000	210	39	119	3100
LZW-4000	12	7000	210	39	138	4000

* Based on 35°F ammonia cooling water to 40°F

LaZerWeld Series Plate Heat Exchanger

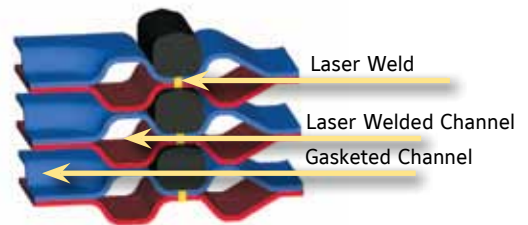
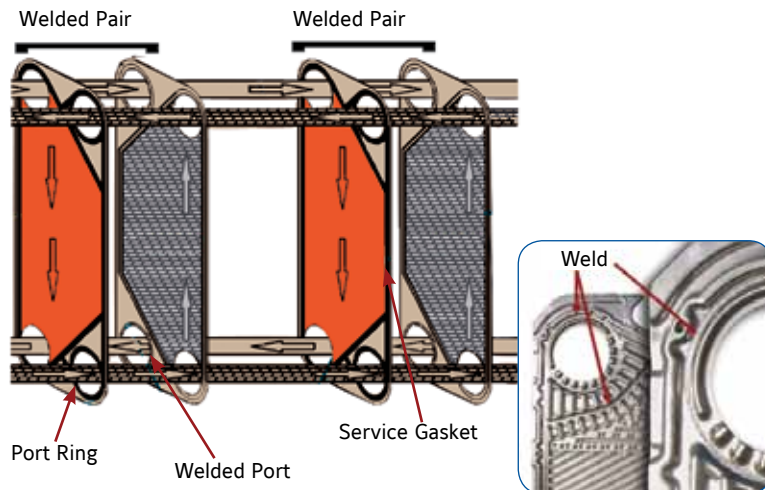
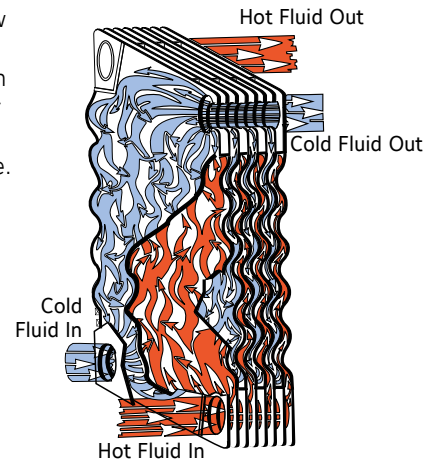
Maximum Performance, Minimal Space and Low Volume Holdup

The heat transfer plates are the heart of the LaZerWeld heat exchanger providing reliability, efficiency and economy of operation. These plates are stamped in a corrugated design pattern to induce turbulent flow, then laser welded together in pairs at the flow perimeter, minimizing liquid bypass at the edges via a patented plate design system. The refrigerant flows through this welded plate channel and the fluid to be cooled is in the gasketed channel. The only gasketing in contact with the refrigerant is the circular port ring at the plate entrance and exit. Since the plates are welded pairs, the heat exchanger can easily be expanded should your duty requirements change in the future. Simply add more plate pairs to increase the refrigeration tonnage. Every heat transfer plate size is pressed and laser welded. We stock 304ss, 316ss and titanium plate materials for faster delivery of new units and/or for spare parts.

Plates are made of a variety of different alloys including 304 or 316 stainless steel, Incoloy 27-7Mo, Hastelloy C2000, titanium and other ductile alloys.

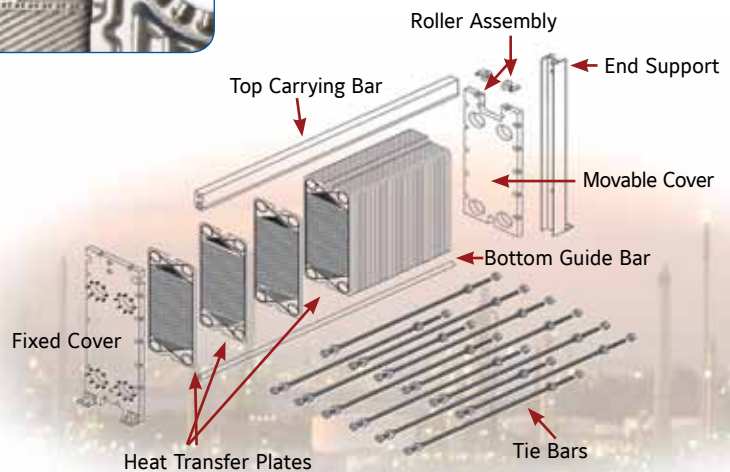
Gasket materials include neoprene and a selection of NBR's and EPDM's. FDA compliant gaskets are also available for certain direct product chilling duties.

Typical Flooded Evaporator



Welded pairs are aligned in a rigid, polyurethane painted carbon steel frame through the use of a top carrying bar and bottom guide bar as illustrated. Plates have an integral hanging eye to facilitate installation and maintain proper plate alignment and support within the frame.

Units can be designed for full vacuum up to 450 PSIG and temperatures from minus 40°F to 350°F.





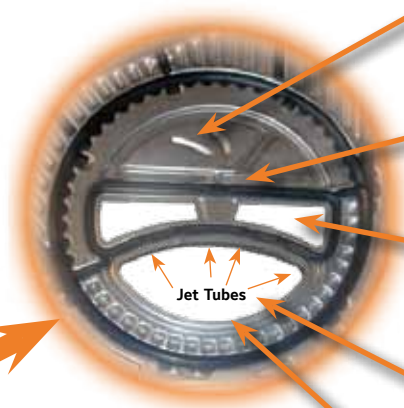
Tri-Flash DX Series – Offers Stable Process Control through Uniform Feed Distribution

The unique patented Tri-Flash DX series Plate Evaporator is specifically designed for the direct expansion "DX" refrigeration market. For successful "DX" evaporation the two-phase feed must be evenly distributed between all parallel channels in the plate pack of the heat exchanger.

The Tri-Flash plate feed system is integral to the heat transfer plate port to ensure a uniform feed distribution to all plate passages and to promote optimum heat transfer efficiency. Proper feed distribution prevents liquid bypass, provides better process control and improves cooling performance. The "DX" series design provides a more equal feed distribution as compared to the use of a distribution tube in the feed port of the heat exchanger.

The Tri-Flash Plate Evaporator advantages include:

- Eliminates the need for distribution tube.
- Plates can easily be added for increased capacity.
- Efficient heat transfer for optimum performance.
- Lower refrigerant charge.
- Smaller size; reduced footprint.



Third and final flash integral to welded pair refrigerant is turned laterally into flow passage.

Second flash transfer port into plate pair

Transfer port allows redistribution laterally down the port

Feed port ring (inside welded pair) contains up to four integral feed jet tubes (first flash)

Refrigerant feed from the expansion valve enters the primary port of the heat exchanger

LaZerWeld Plate Heat Exchanger Versus Tubular Exchangers

Why the LaZerWeld provides more for your investment

Flexibility

The LaZerWeld Plate Heat Exchanger allows for future expansion when your refrigeration requirements grow. Semi-welded plate pairs can easily be added to the existing heat exchanger frame.

Saves Energy

The LaZerWeld Plate Heat Exchanger provides approach temperatures as close as 2°F which allows for a higher suction temperature and higher coefficient of performance than a traditional shell and tube exchanger. This will help reduce compressor size and related components of a new refrigeration system.

Less Refrigerant Needed

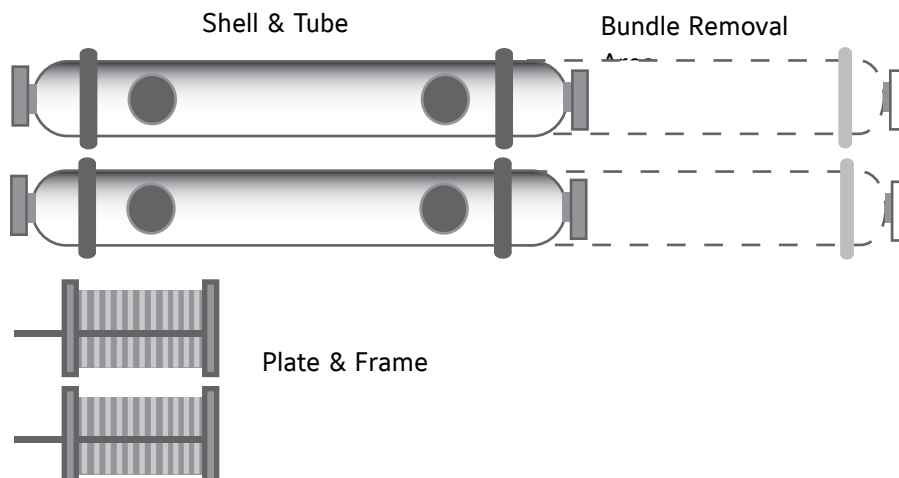
The higher heat transfer coefficient significantly reduces the heat transfer area needed and the narrow plate passages have a low liquid holdup. The amount of refrigerant needed in a LaZerWeld Plate Heat Exchanger is only 20-30% of the capacity compared to a tubular unit. Less refrigerant means more savings on the system charge and is better for the environment.

Models

The LaZerWeld Plate Heat exchanger is available in models that range in connection size from 2" to 12". A single unit can handle up to 6,400 tons of refrigeration.

Smaller Installed Space, Easy to Maintain

LaZerWeld Plate Heat Exchangers use one third less floor space and weigh 1/6th the weight of a tubular heat exchanger. The Plate Heat Exchanger can be maintained within the installed space and without the need to remove piping.





LaZerWeld Plate Heat Exchangers - A Vital Part of Other Quality Frick Products



PowerPac™
Packaged Chillers



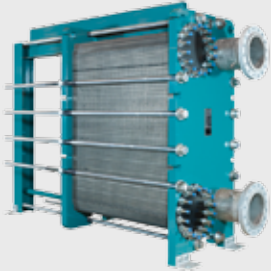
Remote Evaporator
Packages



LaZerWeld

Single Source Industrial Refrigeration Solutions !

Heat Exchangers



Packaged Equipment



Hygienic Air Units



Vessels



Controls



Evaporators



Compressors



Condensers



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CONTAINS 25% POST-CONSUMER WASTE

