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Superior performance, long life across a range of industries

Wherever reliable, efficient, precision heat exchange is required, POLARIS Plate Heat Exchangers are a prime selection.

Strong construction, reliable engineering, superior materials, and efficient operation are part of every POLARIS Plate Heat Exchanger. And one of the many varieties of heat exchangers we produce—double-wall, brazed, shell and plate, all-welded, free-flow or many others—will meet the demanding specifications of the industrial or manufacturing application you have in mind.

PROCESS PREHEATING

Preheated media make industrial systems more economical, efficient

PROCESS FLUIDS HEATING OR COOLING

Providing an excellent means to maintain correct process temps

EFFLUENT COOLING

Isolating and cooling industrial effluents, an ecologically sound application

FACTORY AND OFFICE SPACE HEATING AND COOLING Utilization of temperature differential resources to save money in HVAC uses

WASTE HEAT RECOVERY

Capturing heat generated in boiler blowdown and condenser water

DIGESTER HEATING

Providing close temperature control in digester without direct substrate contact

WASTE WATER TREATMENT

Management of waste flow temperatures in many industrial applications

REFRIGERATION

Another effective PHE application for industrial HVAC requirements

REFINING PROCESS ELEMENTS

Enabling exact temperature media in many types of refining systems







Typical Polaris Applications

The efficiency, reliability, versatility, superior engineering, low maintenance and sturdy construction of POLARIS Plate Heat Exchangers make them a premier choice in many industries. Here are just a few examples:

CHEMICAL PROCESSING

- Brine Heating and Cooling
- Sulfuric Acid Processing
- Caustic Soda Processing
- Vapor Condensation
- Salt Refining
- Resin Cooling

AUTOMOTIVE

- Phosphate Solution Cooling
- Paint Heating
- Induction Heater Cooling
- GENERAL INDUSTRIAL
 - Plating Solution Cooling
 - Anodizing
- Cutting Oil Cooling FOOD PROCESSING

-OOD PROCESSING

- Beerwort Cooling
- Edible Oil Heating/Cooling
- Raw Milk Cooling
- Milk Pasteurization
- Hot Water Generators
- Tomato Sauce Processing

In addition, versatile POLARIS Plate Heat Exchangers are ideal selections for a wide range of HVAC applications in industrial, production and manufacturing settings. For more details on these effective, economical applications, please see our POLARIS HVAC Brochure. POLARIS Plate Heat Exchangers are well adapted to seagoing applications, including:

POLARIS PHES FOR MARINE USES



- Fresh-Water Generator
- Engine Jacket Cooling
- Lube Oil Cooling

Utilizing the heat from diesel engine jacket cooling water, the POLARIS Fresh Water Generator evaporates seawater to produce pure drinking water. Contact us for details on the engineering and applications of POLARIS Fresh Water Distillers.

Seawater filters can also be installed in the plate heat exchanger. This is useful for plate heat exchangers used not only on shipboard, but also in offshore platforms. The filter catches smaller particles, resulting in longer intervals between service and maintenance.

Food processing

In food processing applications, POLARIS Plate Heat Exchangers stand out for a number of important reasons. For many such applications, POLARIS Sanitary Plate Heat Exchangers are the spec of choice. They are easily and safely dismantled, so that they can be cleaned and inspected to the rigorous standards required by the food processing, dairy and pharmaceutical industries.

They can be constructed of hygienic materials—including stainless steel and special gasketing—in the areas that come into contact with foods. They provide reliable separation of fluids, preventing contamination of food products. They can transfer heat rapidly and efficiently to large volumes of fluids, and can be made with wider plate separation to handle viscous or "chunky" fluids. For expert help in integrating POLARIS PHEs into any food processing plant, please contact us. We'll be glad to assist at any phase in the preparation of your food processing system.

All these construction details and thermal characteristics of POLARIS Sanitary Plate Heat Exchangers make them prime choices for heating, pasteurizing, or cooling foodstuffs. And the units' compact size and light weight mean that they can be installed where needed in food processing plants, with the capability to expand capacity easily.





Power plant/cogeneration uses

POLARIS Plate Heat Exchangers are effective components in many power plant and cogeneration applications. Power plants use them to capture waste heat, improving overall efficiency in generating processes. In cogen systems they can also harvest valuable energy that would otherwise be lost.

Typical PHE power plant applications include:

- bearing cooling water
- stator cooling water
- seal water cooling for vacuum pumps

The coolant in such systems is often raw lake, river or seawater. PHEs isolate these potentially fouling or

Our experienced engineering team will help you make the most of power plant or cogeneration design. Contact us for assistance at any phase in the preparation of your system. corrosive media from the generating system equipment. Bernoulli® filters provide further system protection. (See below.)

Superior design and engineering by POLARIS maximize the effectiveness, service life, and conservation

value of such installations. Compact and lightweight, our PHEs can be installed where they're needed. They're built to handle the temperatures and pressures in power generation processes.



Bernoulli filters for trouble-free operation

Choose a Bernoulli Filter from POLARIS, and you get a reliable filter with an ingeniously simple design that ensures continuous, safe operation year after year. They're ideal for power plant and cogeneration jobs that rely on untreated cooling media.



Bernoulli filters use a pneumatic-cylinder-mounted disc for contact-free filter cleaning. The automatic, continuous cleaning sequence needs no manual intervention.

Ethanol production

POLARIS Plate Heat Exchangers are ideally suited to multiple applications in ethanol production facilities. Many steps in the ethanol process—including mash cooling, fermenter cooling, and yeast propagator coolingrequire heat exchangers. The efficiency, reliability, compact size, light weight and excellent thermal performance of POLARIS PHEs make them a strong choice at many process stages. Especially useful is the ease of increasing PHE's heat transfer capacity if the plant grows.



In addition to the process steps named above, POLARIS Plate Heat Exchangers can also exchange heat in fluids to reduce energy costs. This applies to mash-mash interchangers, beer-mash interchangers, and beer-stillage interchangers. In ethanol distillation areas, coolers or other interchangers may be needed for process water or the ethanol itself.

POLARIS FREE-FLOW HEAT EXCHANGERS IN ETHANOL PROCESSES

All such one-phase, liquid-to-liquid exchange processes can be carried out with POLARIS Plate Heat Exchangers. For processes that involve viscous fluids or those with high fiber content, POLARIS Free-Flow Heat Exchangers with no metal-to-metal contact can be specified to promote free flow of the medium. PHEs with regular plate configurations are appropriate for applications with water, ethanol or fusel oil.

> Contact us today to learn more about POLARIS Plate Heat Exchangers for efficiency, effectiveness, expandability and long service life in your ethanol production operations.



Anatomy of a plate heat exchanger



A strong, rigid, durable frame is the foundation of any plate heat exchanger. POLARIS frames are designed according to prevailing national codes. They meet ASME Sec. VIII, Div. 1 construction standards, and are also designed to streamline assembly, service and maintenance. A large roller makes it easy to slide the follower back and forth, so it's easy to open and close a POLARIS PHE for service and maintenance. Optional inspection holes allow convenient examination of the plate pack interior—useful when media contain pulp or fiber, which can cause clogging.

HEAD

Standard POLARIS PHEs are single-pass units with all connections on the head. This configuration simplifies service and maintenance—no need to dismantle the pipe work to access the interior. The head and the column can be equipped with strong foundation feet that make it easy to secure the heat exchanger. This design also makes future plate pack expansion much easier.

PLATE PACK

The heart of each POLARIS PHE is the plate pack, where heat transfer takes place. The pack is formed by plates featuring state-of-the-art plate pattern design. Each plate is fitted with a high-quality gasket to seal the heat exchanger, guide the flow, and align the plate. Combining POLARIS plate types and patterns delivers best PHE efficiency for the thermal requirement of the application.





TIE BOLTS

To cut labor effort and assembly time, tie bolts are made to be tightened from the head side of the heat exchanger. This simplifies opening, closing, and tightening the heat exchanger.



CARRYING BARS

Strong and durable, our carrying bars prevent distortion or slumping from the weight of the plate pack through years of operation. Plates slide easily along the bar, which is long enough to make room to clean the plates without removing them from the frame. Also, the carrying bar on our frames enables extraction of one plate while leaving the others in place.

GUIDING BARS

POLARIS' properly designed guiding bar helps prevent misalignment of the plate pack, properly supporting plates during assembly and when the PHE is opened for service. It's



strong enough to withstand the side load of powerful tightening forces exerted when the heat exchanger is assembled.

CONNECTIONS

Connections in Polaris gasketed PHEs range from 1" to 26". Threaded pipes and flange connections designed according to all applicable standards eliminate the need for reducers in the piping system. To guard against corrosion, flange connections may be lined with rubber or clad in the same material the plates are made from, such as AISI 316 or titanium.

Plate range that covers all requirements

PLATES IN ALL SIZES



POLARIS offers the largest selection of traditional plate heat exchangers in the world. We have specialized in developing plate heat exchangers in close cooperation with our customers. We can perfectly match your individual requirements because we understand the process behind your applications.

Using the right plate for each individual application is very important, as it greatly impacts the efficiency of the entire installation. Several aspects define which plate is right, such as the plate pattern, plate and connection sizes, and plate material.

PLATES IN ALL SIZES

We feature plates with lengths up to 16 feet and a large number of different patterns for each heat exchanger type. It is important to match the length of the plates and the type of pattern to the individual thermal duty—some installations might require short plates, while others require long plates.

COVERING MOST REQUIREMENTS

We cover most requirements up to 32,000 gpm in a single-pass solution. It is beneficial to reduce the number of passes in a plate heat exchanger to a single pass, as it improves the efficiency of the heat transfer, and reduces

the footprint of the heat exchanger. However, in order to do this, it is necessary to use plates and connections that match the size defined by the thermal requirements.

OPTIMAL SOLUTIONS

Our extensive plate selection ensures that we can provide the perfect plate and connection size for any requirements. Whether the application is large or small, the many sizes we manufacture enable us to meet the need in a wide variety of applications.







Traditional Plate

Semi-Welded Plate

The variety of our plates is key to our ability to deliver in so many industrial applications. The many pressing depths and angles of our plates enable Polaris PHEs to supply optimum solutions wherever they're installed.

Most plates are made of AISI 304/316 or titanium, but can also be made from other pressable materials, depending

on media and temperatures. Plates form the plate pack, which is held firmly between the head and the follower of the frame. Corrugated patterns ensure turbulent flow in the entire heat transmission area, helping eliminate "dead zones."



HEAT TRANSMISSION AREA

Our many years of experience in thermal design and plate pressing techniques is our greatest strength. Designs based on this knowledge maximize the heat transmission area of each plate, and improve the thermal efficiency of the entire pack. Our process knowledge enables us to develop heat transmission areas that perfectly match your requirements, delivering a plate size optimized for maximum efficiency.



DISTRIBUTION AREA

The distribution area on POLARIS plates features angled guiding channels that ensure an even distribution of the media across the entire plate, preventing "dead zones." Pressure drop in the distribution area is minimal. It's used in the heat transmission area instead, for better heat transmission.



HANGING SYSTEM

In our unique, reinforced hanging system, plates are securely suspended from the carrying bar and perfectly aligned by the guiding bar. In heat exchangers made without reinforced hanging systems, plate corners can collapse, causing leaks and plate replacement. Our system extends the lifetime of the plates and reduces service intervals.

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EDGE REINFORCEMENT

POLARIS plates feature reinforced edges that strengthen the gasket groove and provide optimal support. The reinforcement is made by pressing the



plates on both sides of the gasket groove, fixing the gasket securely in place and providing a solid foundation for adjacent plates.



MAIN PLATE PATTERN

Pattern Properties

Each pattern is developed to handle specific duties and meet individual requirements. Allowed pressure drop for media in the heat exchanger correlates with the size of the unit. The size needed for the heat transmission area can be reduced if greater pressure drop is used, making it important to use the allowed pressure drop to the fullest.

Some patterns use a low pressure drop, but offer a lower level of turbulence. Others trade high turbulence for a high pressure drop. Patterns with very deep channels are suitable for high-viscosity media and those that cause fouling. Some patterns combine multiple channel depths in a single plate to handle the flow rate and thermal requirements for different media in a single heat exchanger.

With a large variety of patterns for each plate size and an extensive plate range, POLARIS provides the best possible technical solution for your specific application.

Pattern Development and Innovation

Our plates feature state-of-the-art plate pattern design and are manufactured with the latest pressing technology. Our many years of experience with pressing tool design also allows for more uniform plate geometry.



IN-HOUSE GASKET PRODUCTION

The gasket is an essential part of any plate heat exchanger. Only high-quality gaskets that fit the plate perfectly and seal tight can maximize the performance—and service life—of the units.

POLARIS gaskets are designed and developed according to the latest standards in rubber formulation and gasket design. We provide gaskets that meet all thermal requirements and are ideally suited to the media used in each heat exchanger.

The result: superior performance thanks to perfect interaction between plate and gasket.

MATERIALS

Gasket quality is a function of its design and materials. Composition of the rubber compound not only determines the gasket's lifetime and ability to maintain elasticity, but also its areas of application. Some gaskets are better suited for aggressive or foul media than others, so it is important to choose the right gasket for the right duty.

The unique design and low compression of POLARIS gaskets mean long service life. To meet all possible service needs, we use nitrile, EPDM, Viton, chloroprene, Hypalon, and butyl.



Our own in-house production and testing facilities ensure the uncompromising quality of our gaskets.



POLARIS PRES-TITE SYSTEM

POLARIS gasketed plate heat exchangers are fitted with the POLARIS Pres-Tite System, which "locks" the plates together and perfectly aligns the plate packs. Strong rubber buttons on the gaskets fit perfectly into the back of the adjacent plates for correct alignment.



POLARIS Pres-Tite rubber button.



Buttons lock the plates together.

POLARIS Pres-Tite rubber buttons are evenly spread out across the gasket, ensuring easy assembly and maintenance.

POLARIS GUIDE GASKETS

POLARIS Semi-Welded plate heat exchangers employ a system that guides the plates together using a closed-gasket groove. This keeps the plates properly

in place when the heat exchanger is assembled. The design is also well-suited for high working pressures and vacuum applications, as the pressure inside the gasketed area helps keep the gasket in place. This system is used in all our semi-welded plate heat exchangers, condensers and evaporators.



The gaskets guide the plates during assembly. The gaskets fit perfectly into the empty gasket groove on the back of each plate, making the process easy and problem-free.



The pressure from the flow area of the plate keeps the gasket in place. This makes this type of gasket well-suited for high-pressure installations.

Polaris Safety-Pair Double-Wall Plates



Because any leaks are external instead of internal, the media will never combine. This makes Safety-Pair Double-Wall Plates the ideal solution when the heat exchangers utilize media that must not be allowed to mix.



POLARIS plate drain zone.



POLARIS Safety-Pair Double-Wall Plate. The "double plate" inlets are welded together.

Polaris semi-welded plate heat exchangers

WHAT DOES THAT MEAN FOR YOU?

When operating with media such as ammonia, POLARIS offers durable solutions designed to withstand extreme conditions and minimize risks associated with aggressive media.

The POLARIS semi-welded plate heat exchanger range

is designed to let you operate without worry, when using media unsuitable for fully gasketed heat exchangers.

Instead of regular plates, the semi-welded range uses two plates, laser-welded together to form cassettes. Each cassette features a gasketed side for the non-aggressive media, and a welded side with only a ring gasket, for the aggressive media. The material of the ring gasket is chosen based on its ability to resist the damaging media.

The limited exposure of the resistant gasket ensures a long product lifetime and safe operation.

The efficient design reduces the number of plates required for high performance and consequently lowers the hold-up volume.

Engineered to use a smaller volume of potentially hazardous media, the POLARIS semi-welded range is a sound and responsible choice for demanding duties.



COMMON APPLICATIONS

- Industrial refrigeration, including duties that use ammonia as a refrigerant
- Evaporation and condensing duties
- ► High pressure liquid/liquid applications
- Chemical processing, for instance rich/lean amine treatment

Service and Maintenance

We can help you avoid problems before they arise with a customized program, ranging from full Our service department offers repairs, upgrades, and on-site cleaning of your plate heat exchanger installations of all brands.

maintenance support to an emergency service call. We will work out the most suitable schedule with you to carry out performance diagnostics, plate cleaning and inspections, fault checking with quick replacements, and repairs as required.

POLARIS also works with independent, certified regional and national service companies who provide rapid

response to your service needs. Skilled technicians will swiftly dismantle your heat exchangers and expertly clean each plate using economical, environmentally friendly methods.

If your plate heat exchanger is dirty or underperforming, our repair services will restore your installation to proper working order. We replace defective or worn gaskets, as well as damaged or leaking plates, with originals or high-quality replacements that perfectly match the specifications of your installation.

We will quickly have your installation up and running at full capacity again. Whatever your needs, dedicated service teams are standing by to help.

Technical specifications

Frame

Painted frame, blue RAL 5010. (Also available in other colors). The frame is equipped with tie bolts placed around its edge.

Design Pressure

150/250/300/400 PSI. Other design pressures are available on request.

Design Temperature

-4 °F to 350 °F. Other design temperatures are available on request.

Connections

From 1" up to 26" flanges in carbon steel, rubber lined, or clad with AISI 316 or titanium.

Plate Material

AISI 304/316 stainless steel, titanium, Hastelloy, SMO-254. Other materials are available on request.

Gasket Materials

NBR, EPDM and Viton are standard. Other materials are available on request.

Performance Certificates AHRI (LLHE-400)

Construction Standard ASME Sec. VIII, Div. 1 / CRN

Classification Societies

ABS / BV / CCS DNV-GL / LRS / NKK RINA / RMRS / CR CSC BPV

Extra Equipment

OSHA-compliant safety shroud standard on all units. Modular removable insulated jacket, optional. Instrument flange, optional. Inline port strainer, optional. Drip tray, optional.



100% customized solutions that provide reliable, unmatched heat transfer

Polaris

Polaris Heat Exchangers • 1151 Broad Street, Suite 218 • Shrewsbury, NJ 07702 732.544.8800 • www.polarisphe.com • info@polarisphe.com