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HISAKA, YOUR TRUSTED ASIAN BRAND

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10th Anniversary HISAKA SOUTH EAST ASIA

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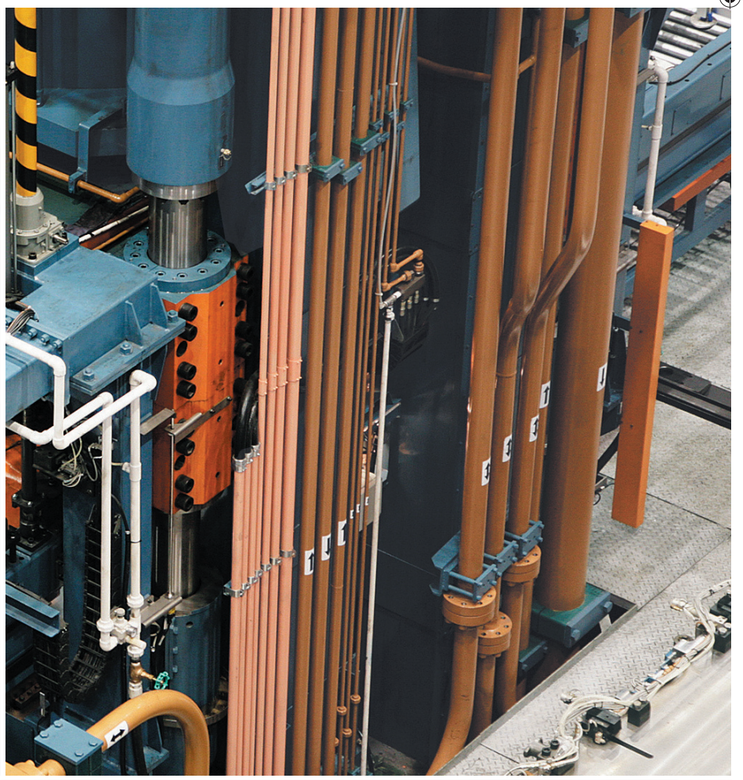
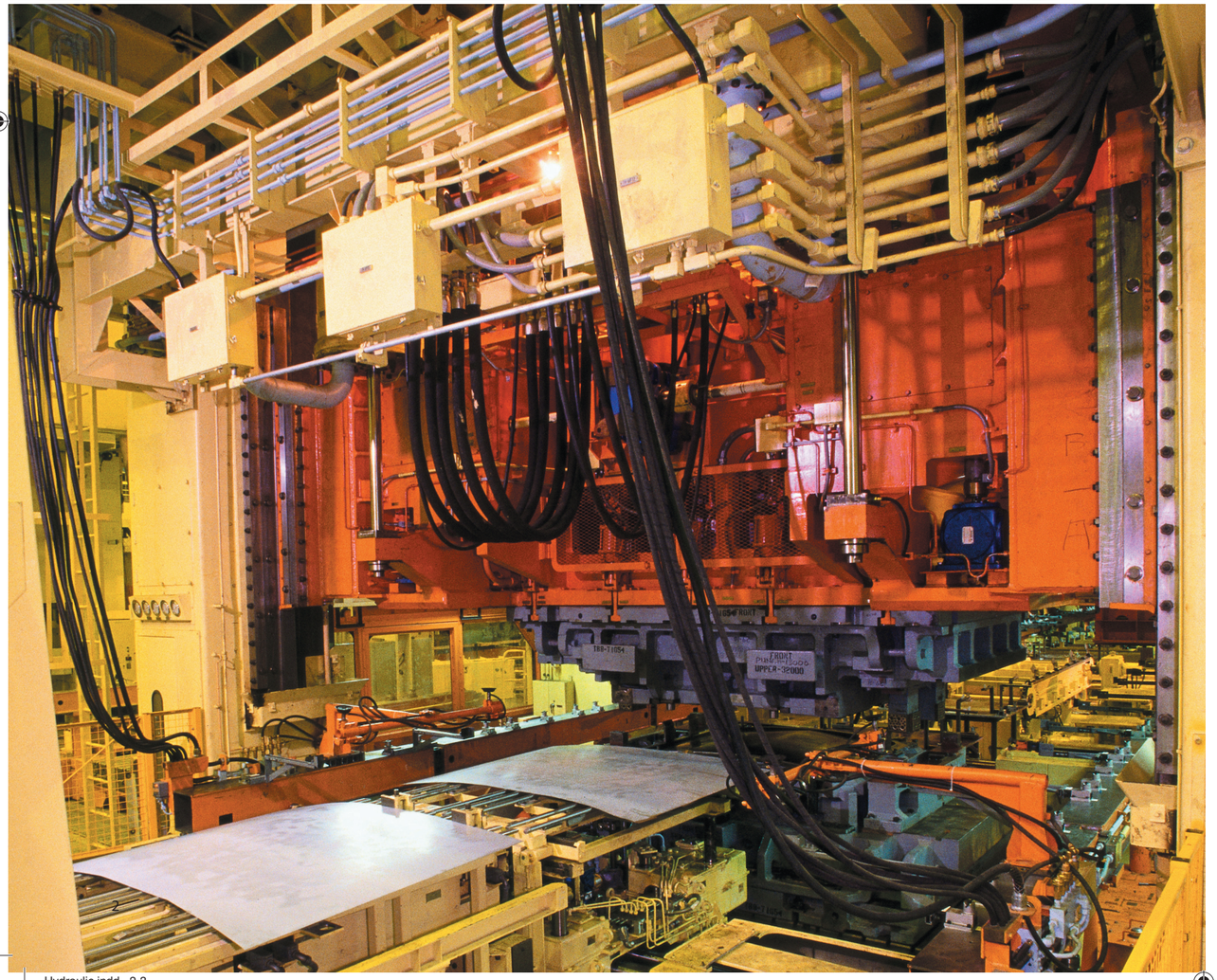
challenge for innovation

Hydraulics

Plate Heat Exchanger

HISAKA





HISAKA PLATE HEAT EXCHANGER WILL EXPAND THE POSSIBILITIES OF THE HYDRAULIC MACHINERIES.

Pascal principles state that pressure applied to a fluid in a closed system will be evenly distributed with the same force. Pascal principles have been widely applied in hydraulic machineries to harvest essential power source for various industries usage.

Heat exchangers plays an essential role in cooling hydraulic fluids as mechanical efficiency depends greatly on the temperature of the hydraulic fluids (directly proportional). Precisely, hydraulic fluids heat up vigorously under high pressure; therefore, cooling down hydraulic fluids warrants optimum performance of the hydraulic machines.

HISAKA Plate Heat Exchanger (PHE) does not only able to meet stringent industrial standards and requirements, it also provides additional benefits such as:

1. It is compact in size, ensuring great usage possibilities of hydraulic fluids in hydraulic machineries
2. It further enhance machineries performance excellent by supporting small temperature adjustments
3. It is able to prevent degradation of the hydraulic fluids in the machine, hence, enforcing quality assurance

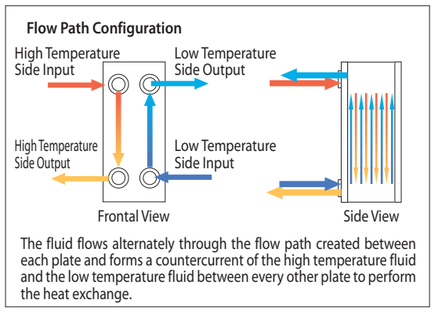
The latest 20,000 ton press machine

Plate heat exchangers are also used to cool the oil in the hydraulic system of the latest 20,000 ton press.

HISAKA Plate Heat Exchanger and Brazed Heat Exchanger

Plate heat exchangers (PHE) plates:
- Pressed thin metal plates that have convex and concave wave patterns (herringbone patterns)
- Made of corrosion resistant materials, such as stainless steel or titanium
- Perimeter of the plates is sealed with synthetic rubber gaskets (slit in or glue on method)
- Suspended perfectly on both upper and lower guide bars
- Fastened and compressed by a fixed and moving frame

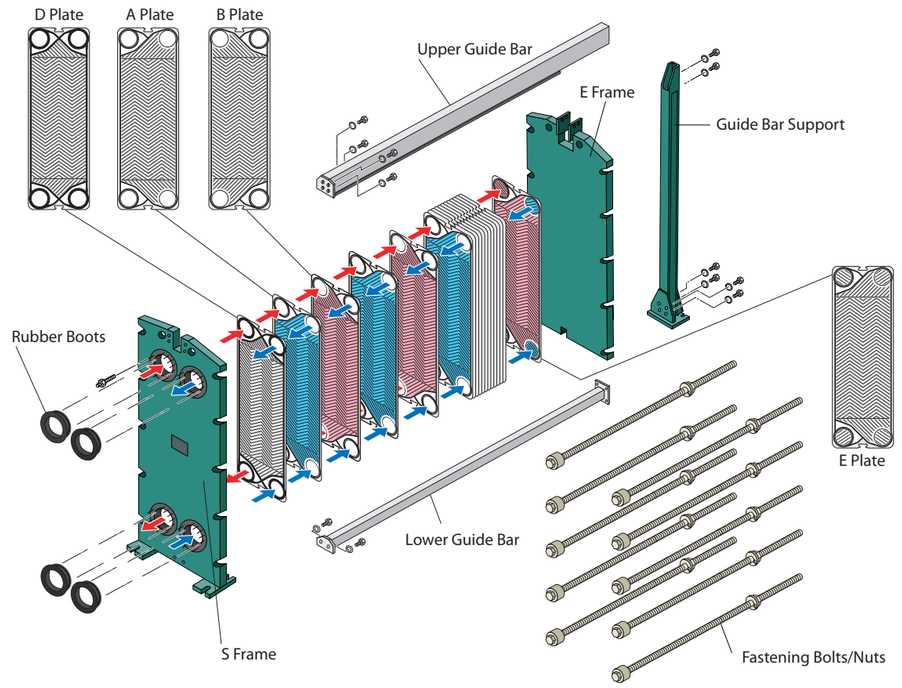
Mechanisms:
* Counter current flow of high temperature fluid and low temperature fluid flowing against each plates. This phenomenon ensures heat transfer to take place.
* Gaskets ensure that the flowing fluids do not intermix.



The fluid flows alternately through the flow path created between each plate and forms a countercurrent of the high temperature fluid and the low temperature fluid between every other plate to perform the heat exchange.

Structure of a Plate Heat Exchanger (PHE) and Flow of Fluids

- Thin stainless steel metal plates are sealed with rubber gaskets and are compressed together.
- Inverting single plate would change plates type from A-plate to B-plate.
- Plate types determine and configure the flow of fluids, wherein fluids (both high and low temperature fluid) provided from the four port holes of the frames can flow in counter - current direction without intermixing.

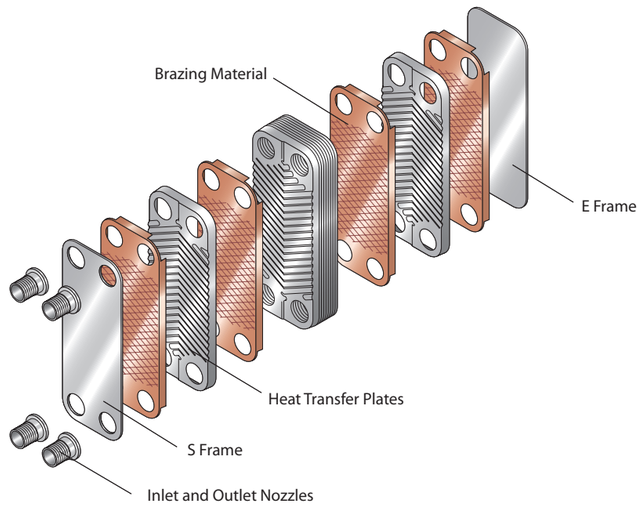


Structure of a Brazed Plate Heat Exchanger

Brazed Plate Heat Exchangers (BHE) are heat exchangers that maintains a high economic heat efficiency whilst providing high heat transfer capacities which is exhibited by conventional gasket type plate heat exchangers. However, the difference between BHEs and PHEs are that the weight and size of BHEs are much more reduced. In addition, BHEs are also more robust and have higher economic heat efficiency based on the HISAKA's brazing technologies.
BHE has a simple configuration which is made of simple steel heat transfer plates while a stainless steel S frame and E frame is used to secure those plates. The outlet and inlet nozzles are made of stainless steel which will be used to guide the fluids into the BHE.
Brazed Plate Heat Exchangers are created by placing stainless steel plates and brazing materials such as copper or nickel side by side. Then, such combination is heated to a temperature exceeding 1100°C in a vacuum furnace. This action would melt the brazing material prior solidifying the metals and lastly integrating the plates with one and another.

Structure of a Brazed Plate Heat Exchanger (BHE)

Brazed plate heat exchangers are created by layering stainless steel plates and a brazing material such as copper or nickel and then heating this to a temperature exceeding 1100°C in a vacuum furnace and melting the brazing material to solidify and integrate the plates with each other.



HISAKA Plate Heat Exchanger (PHE) has press-molded herringbone patterns which increases the heat transfer performance even with a reduced heat transferring area as compared to shell and tube heat exchangers. In comparison:

i. HISAKA PHE is able to achieve higher heat transfer coefficient
ii. HISAKA PHE is 1/4 lighter and 1/3 of the size of shell and tube heat exchanger

An advancement of PHE is Brazed Heat Exchanger (BHE), which is even lighter and more compact in size as compared to PHE. Furthermore, its brazed structure allows it to withstand even higher pressure.

Nevertheless, both HISAKA PHE and BHE have the advantages of:

i. Excellent thermal efficiencies due to counter current flow of the flowing mediums
ii. Possibility of reducing the temperature difference (between the outlet temperature of the low temperature fluid and the inlet temperature of the high temperature fluid) to as low as 1°C
iii. Efficient heat performance due to constant minimum holding volume
iv. Great flexibility to allow high precision and immediate modifications of operating conditions

ADVANTAGES OF PLATE HEAT EXCHANGERS (PHE)

1. Excellent Ease of Maintenance
- Assembly and disassembly are made convenient by simply removing the fastening bolts
- Maintenance are thereby made easy, even for visual inspections and cleaning

2. Easy Modification of Heat Operating Conditions
- Flexibility in modifying the heat transferring surface area by simply increasing or decreasing the number of plates

Advantages of Brazed Plate Heat Exchanger (BHE)

1. Excellent Heat - Resistant and Pressure - Resistant Performance
- Sturdy brazed structure (due to the absence of gaskets)
- High level of sealing giving add - on advantage of excellent pressure resistance, heat resistance and temperature resistance

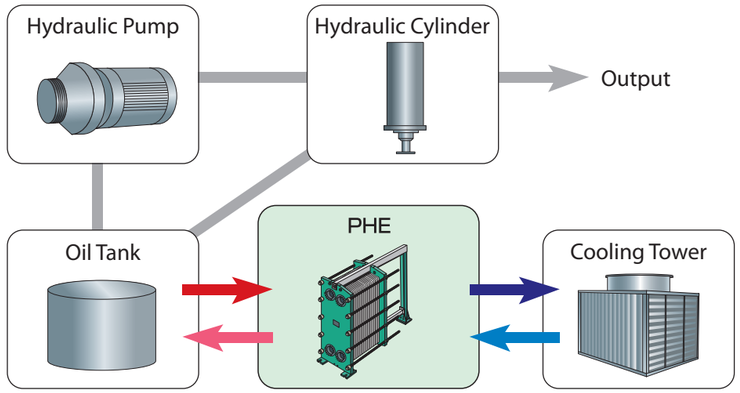
2. Excellent Economic Efficiency
- Efficient yet economical due to its minimum amount components
- Possibility of mass production due to its low cost

HISAKA Plate Heat Exchanger - ideal for reducing the size and weight of hydraulic units

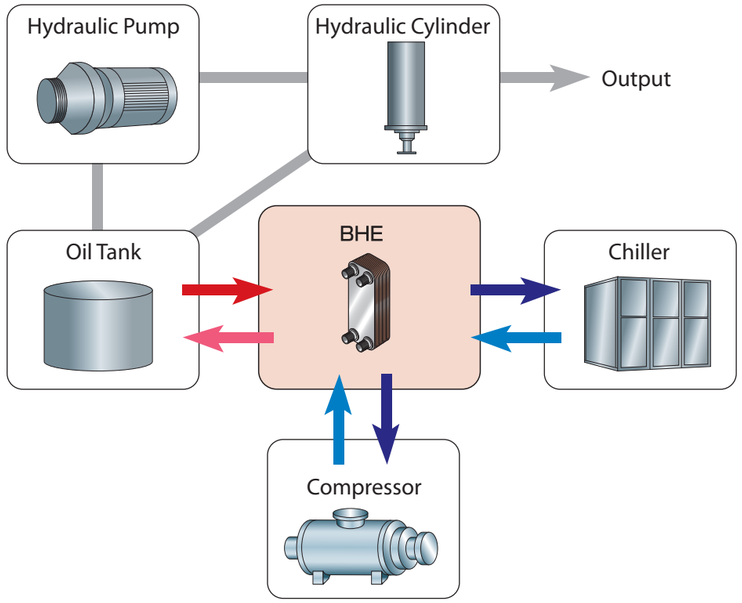
The oil which circulates within the hydraulic machine accumulates heat proportionately to the amount of work. Therefore, HISAKA Plate Heat Exchanger (PHE) in needed to cool down the temperature of the hydraulic fluids in order to maintain its ideal temperature for optimum performance. Furthermore, HISAKA PHE enables both size and weight reduction within the hydraulic units.

Mechanism of Hydraulic Unit

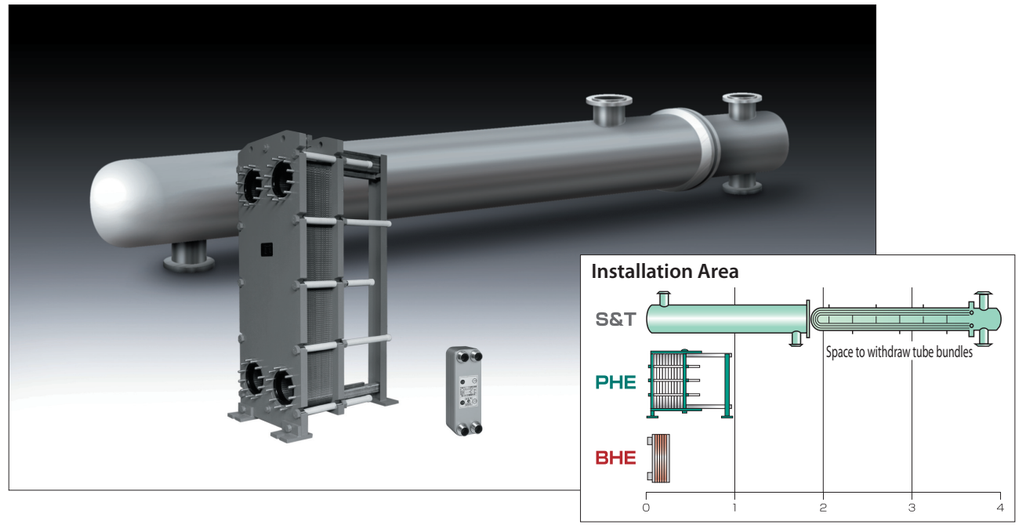
Plate Heat Exchanger (PHE)



Brazed Plate Heat Exchanger (BHE)



Comparison with Shell and Tube Heat Exchanger



Inquiries regarding Plate Heat Exchangers

Please make inquiries by FAX upon filling out the required items in the form below. We will select and provide an estimate for the perfect heat exchanger from our broad lineup.

Plate Heat Exchanger – Design Requirements			
	High Temperature Side	Low Temperature Side	Remarks
Fluid Name	Operating Oil	Cooling Water	
Properties	ISO VG *1	Water	
Input Temperature °C		*2	
Output Temperature °C		*2	
Flow Rate m³/h		*2	
Heat Exchange Volume kW			1kW=860kcal/h
Pressure Drop MPa			1MPa=10.2kg/cm²
Design Pressure	1.0MPa	1.0MPa	
Design Temperature	99℃	99℃	

*1 Please list the type of the operating oil that will be used. The units will be designed for ISO VG32 unless specified otherwise.
*2 Unless specified in particular, the units will be designed for operating conditions of normal industrial water of 32°C to 37°C. In addition, please be sure to list the required volume.

Name of Company _____ TEL _____

Name _____ FAX _____

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