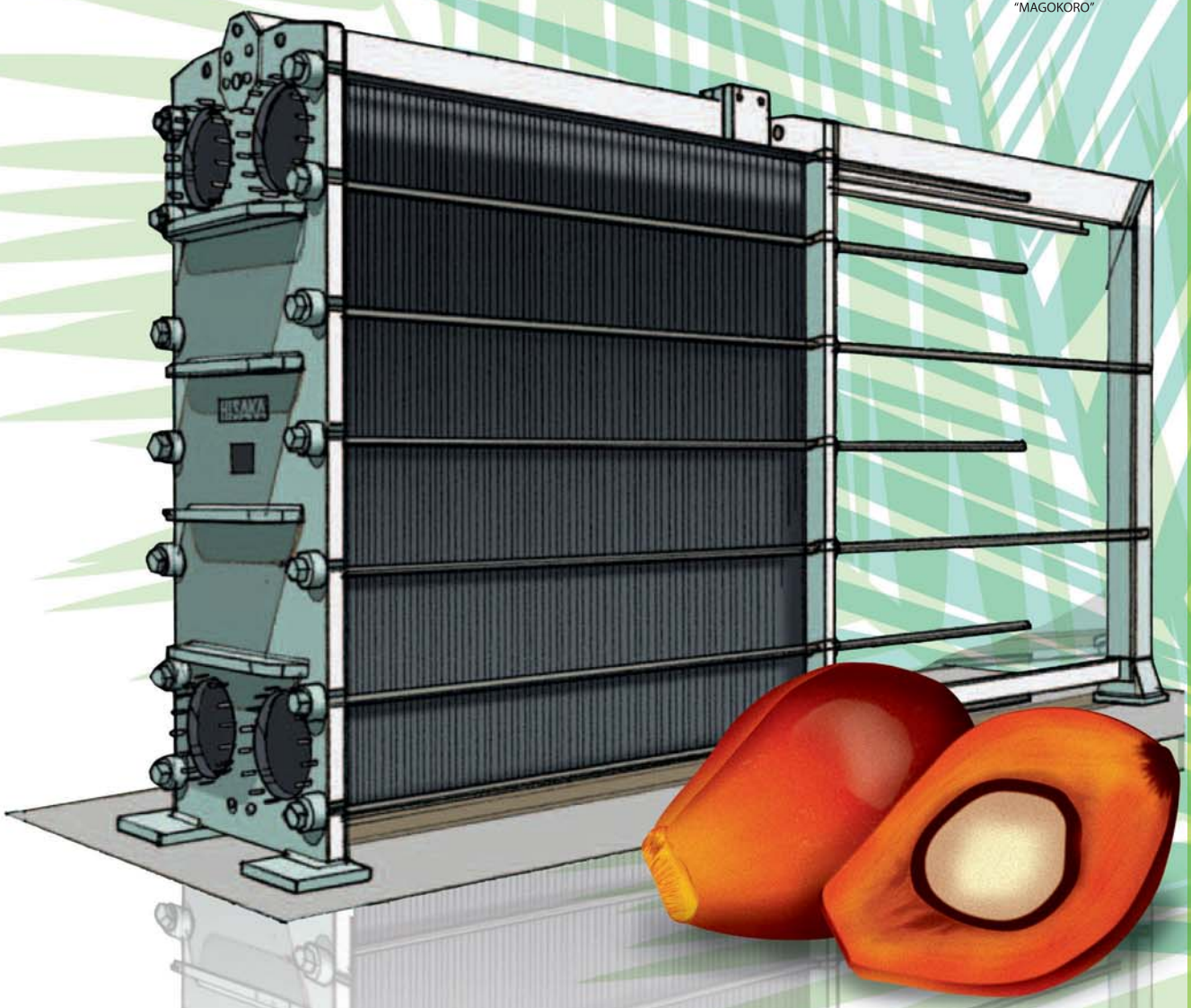
PLATE HEAT EXCHANGER *for* PALM OIL

HISAKA 誠心

...WITH OUR SINCERITY
"MAGOKORO"



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The mechanism of efficient heat transfer

• Hot fluid (e.g. RBD) and cold fluid (e.g. CPO) are flowed through the four specified portholes at the four corners of each heat transfer plate. These heat transfer plates are made of press-formed thin sheets of metal with a high corrosion resistance (e.g. stainless steel or titanium). One plate can be used in two ways: either as an A-plate or, by turning it upside down, as a B-plate. Plate channels are formed between these heat transfer plates. The Hot fluid flows in the opposite direction to that of the cold fluid, and heat transfer is performed.

• A heat transfer plate has various corrugations and grooves for mechanical strength and its increased heat transfer area. The plate, with corrugations and spherical bumps on the surface, is designed to induce turbulence of the fluids in the plate channels, and therefore to achieve a very high heat transfer coefficient and the most efficient heat transfer.
A gasket is mounted in the peripheral groove of the plate to seal the fluid in.

Features

Prevention of liquid inter-mixing
Special consideration is taken into the gasket so as to protect it from direct attack by liquid. Furthermore, the gasket is of double-seal type so as to permit liquid draining outside the exchanger even in a case of liquid leak caused by its deterioration.

Easy change of performance
According to change of the treating capacity, the heat transfer surface area can be incremented/de-cremented by unscrewing the plate clamping bolts and increasing or reducing the number of plates.

Steam available as heat source
The use of synthetic rubber gasket of special composition permits to use steam as heat source, i.e operating temperature range up to 180˚C maximum.

Less installation space
The lightweight and compact construction reduces the installation space and the weight to 1/4 and 1/3 of shell & tube heat exchanger respectively. In addition, lightweight and thin heating plate with less liquidhold facilitates the installation work. The Plate Heat Exchanger can be disassembled for cleaning without piping work, while the shell & tube heat needs a additional space for drawing out the tube bundle.

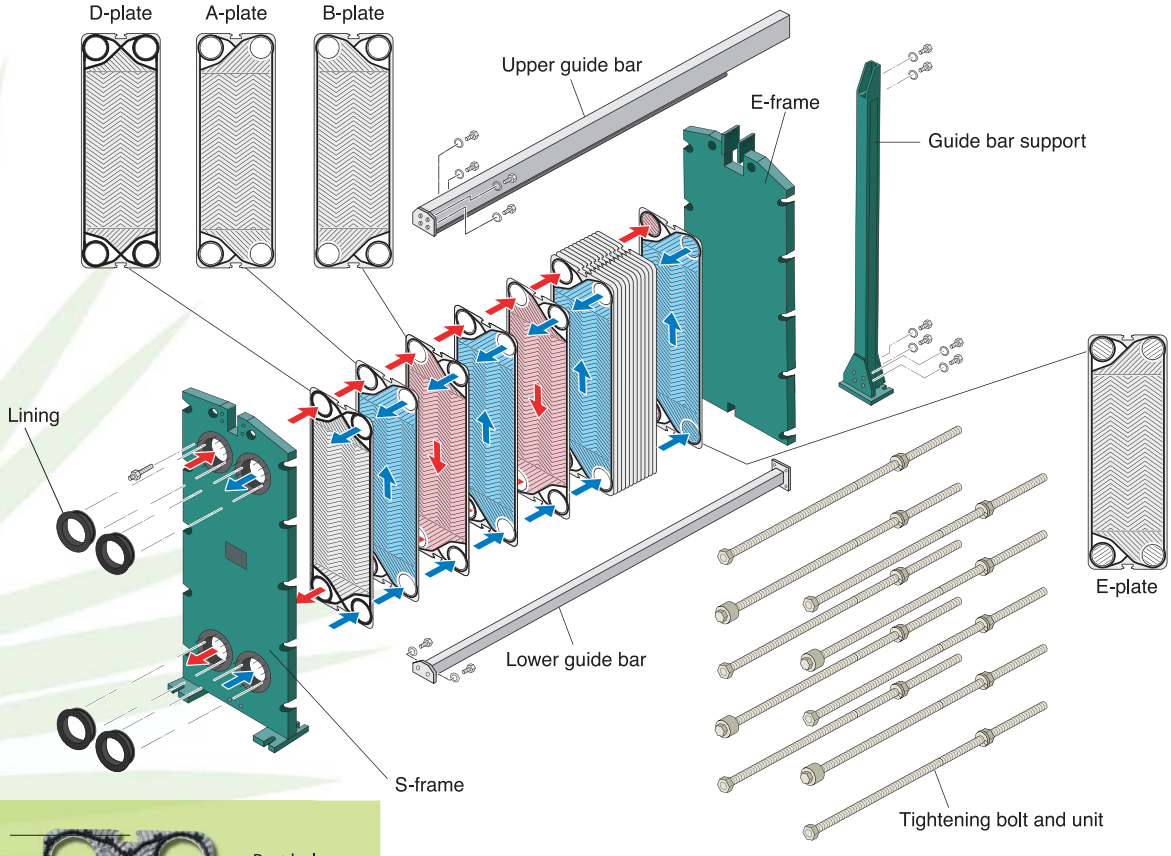
High performance
The overall heat transfer co-efficient (U-value) ranges from 4,000 to 9,000 W(m2·˚C) in water application, since the plate corrugation provides high turbulent flow. This is one of the reasons why plate heat exchanger is so high heat transfer coefficient. In addition, this turbulent flow also acts to prevent scales from the plate surface.

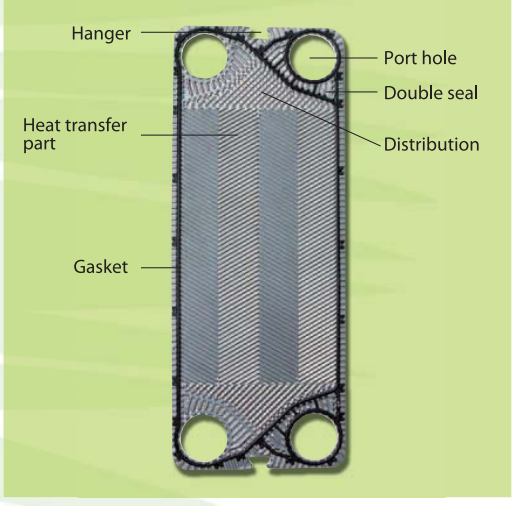
Two fluids temperature difference up to its extremely close...
The construction which permits heat exchanging in perfect counter-current flow with very high heat transfer efficiency makes it possible to utilize the temperature difference between hot fluid and cold fluid up to 1˚C and less.

Flow of Fluid and Heat Exchange Mechanism

Heat transfer A and B-plates are of identical pattern. One simply turned upside-down becomes to the other so as to obtain a different flow channel by the gasket line. Further, by the start plate (D-plate) having its portholes with double seal gaskets and the blind last plate (E-plate), the construction is such that the fluids do not directly contact the frames.

Construction plate heat exchanger



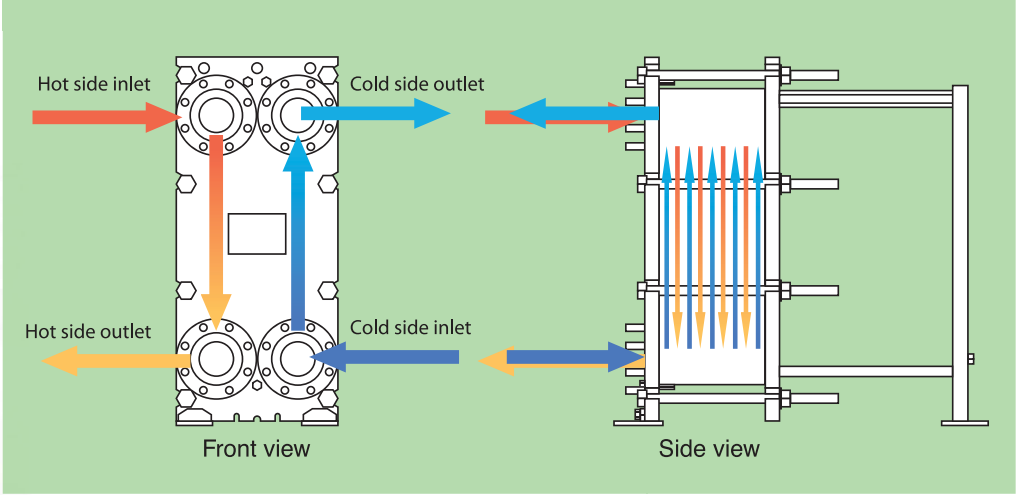


Heat transfer plates

Each heat transfer plate is corrugated to various patterns to increase its strength and heat transfer area. Furthermore, the corrugation creates high turbulence and thereby achieve high heat transfer coefficient. The plate is provided with passage hole on each corner. Each plate is tight-sealed with a gasket fitted in its peripheral groove.

Flow channel

The plates are divided into A-plate and B-plate, and a passage is formed between these plates. The high temperature fluid flows alternately and in the opposite direction of the other fluid. Thus high efficient transfer of heat is achieved through these plates. A-plate when reversed would become B-plate. As such only one type of plate can be used as A-plate and B-plate for most models.



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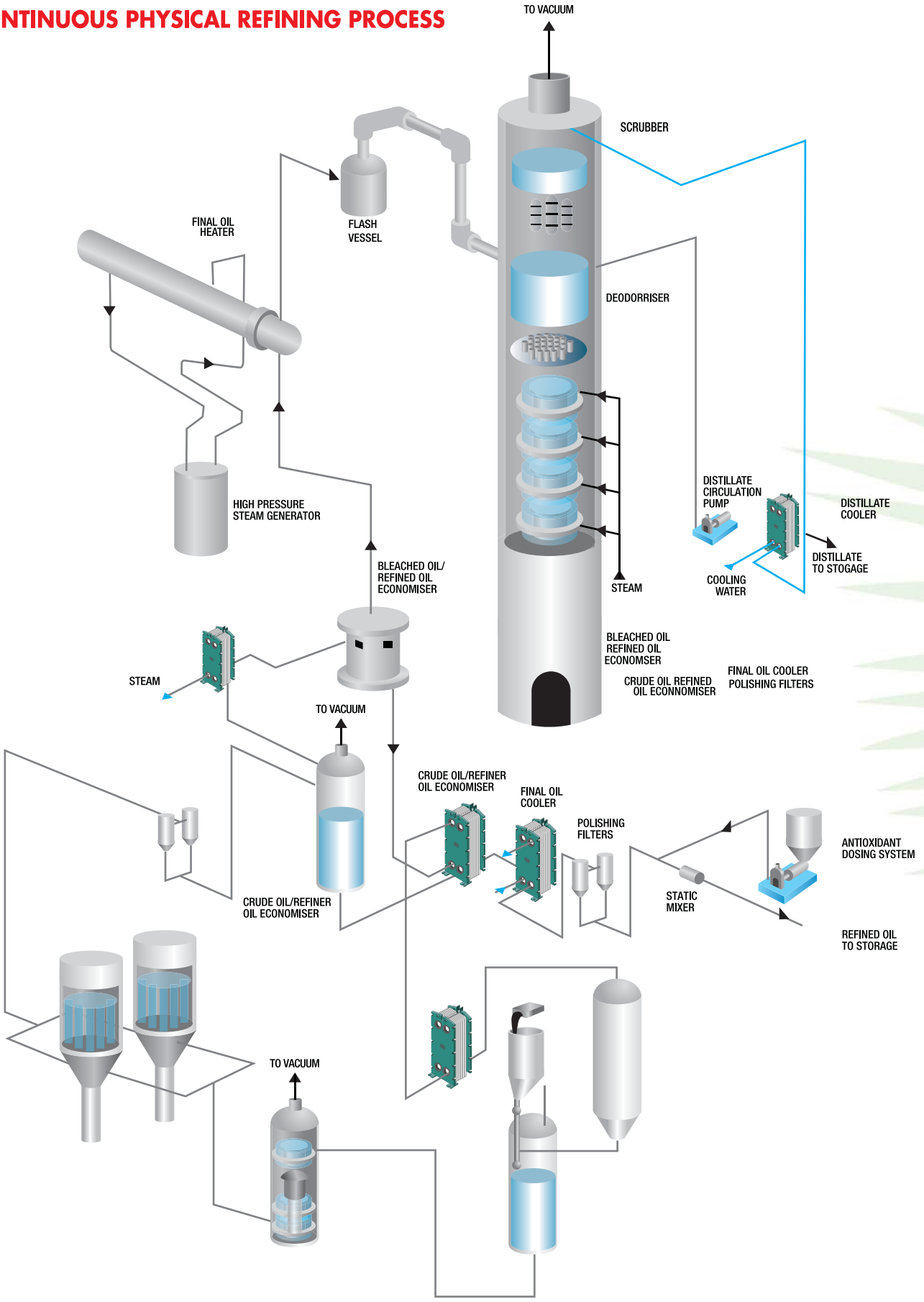
CONTINUOUS PHYSICAL REFINING PROCESS



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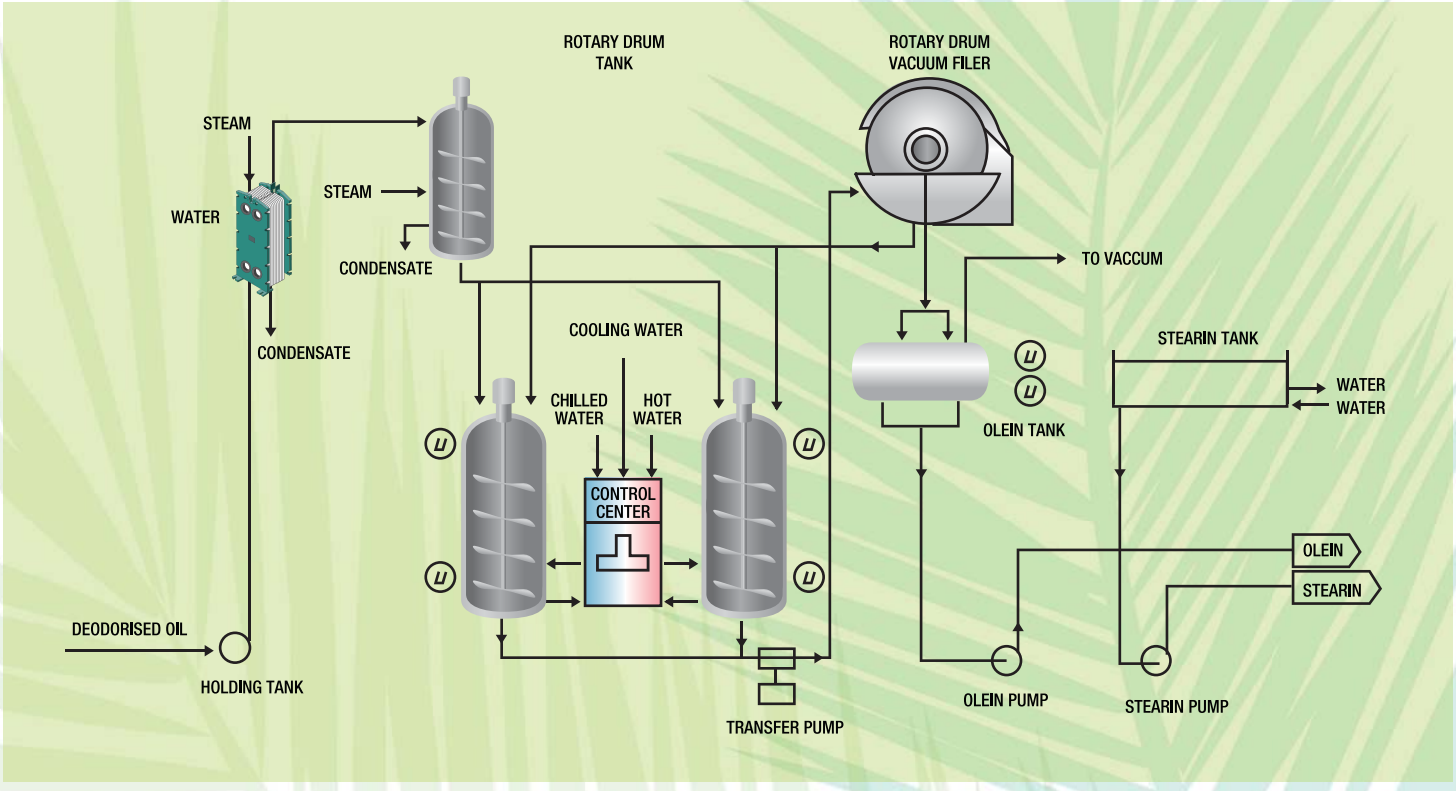
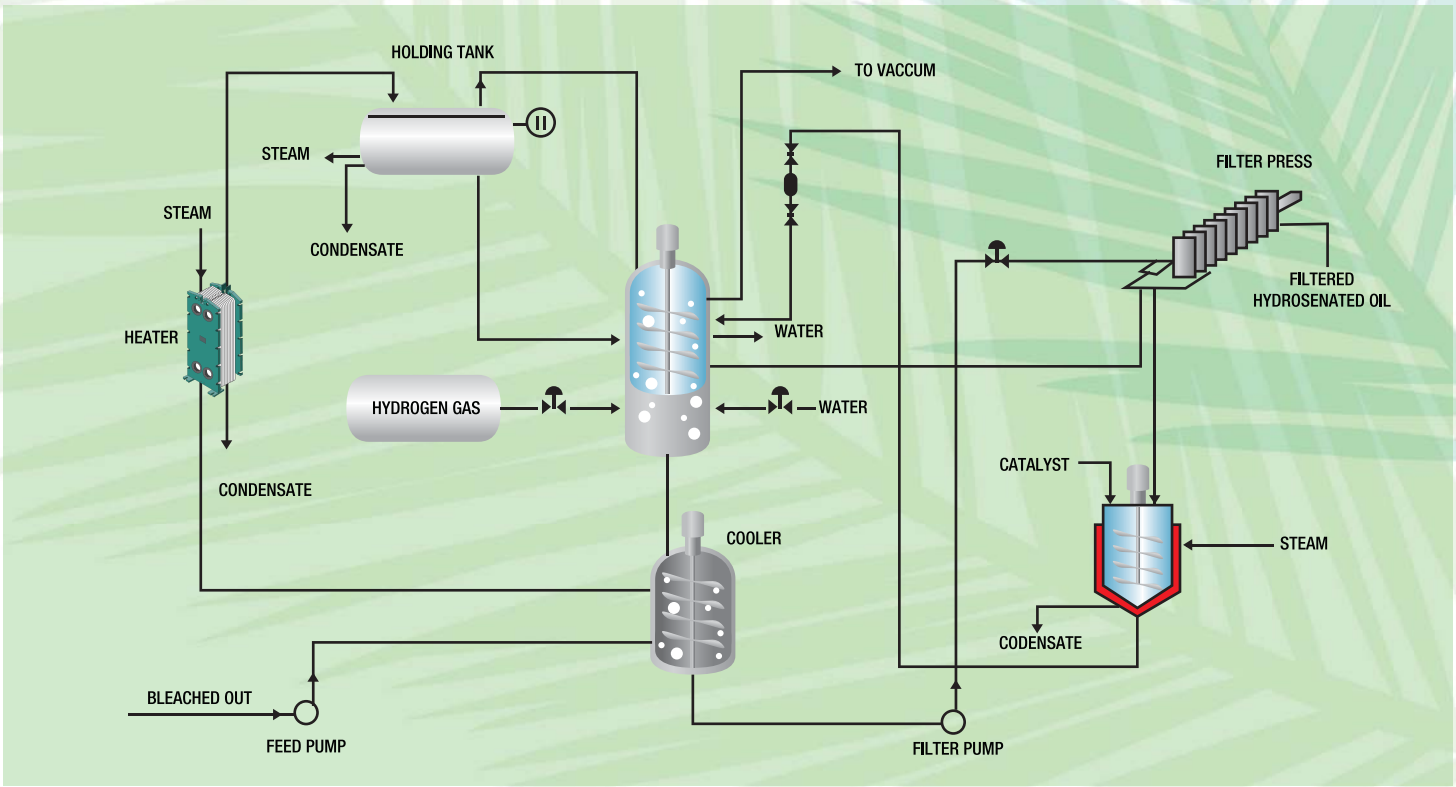
DRY FRACINATION



HYDROGENATION



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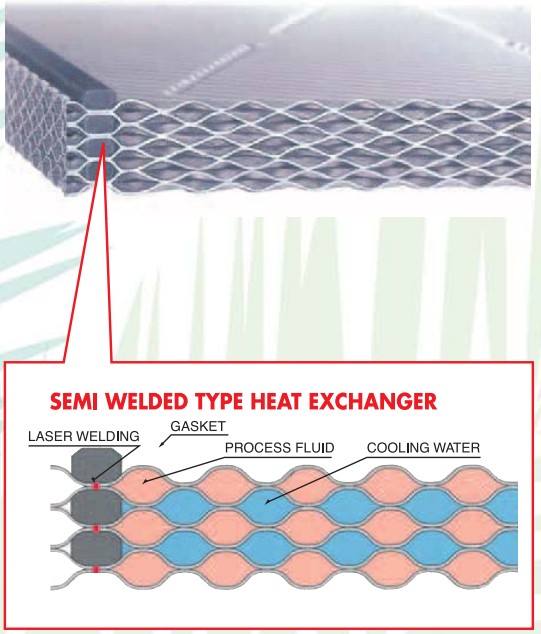
CUSTOMIZE PHE FOR PALM OIL INDUSTRY

Semi welded plate

Features

High heat transfer coefficient owing to uniform distribution of flow to entire heat transfer is by special plate pattern.
A couple of plates are laser welded with o-ring at port holes between the plates, thus semi-welded plate heat exchanger can be used for higher pressure compare to conventional Plate Heat Exchanger.

CONSTRUCTON of SEMI WELDED PLATE



Advantages

1. High pressure resistance is about 2 to 3 times higher than all gasket type heat exchanger.
2. Save maintenance cost.
3. Chemical resistance TCG o-ring and synthetic rubber are selectively used.
4. Nozzle pitch dimensions of semi-welded plate heat exchanger are same to those of following plate heat exchangers.
   WX-10 and RX-10
   WX-50 and RX-50
   WX-90 and UX-90
   Therefore, RX-10, RX-50, UX-90 can be replaced to WX series without changing location of connection pipes.
5. Different from full welded plate heat exchanger, Semi-welded plate heat exchanger can be easily added plates to increase capacity.
6. Semi-welded plates heat exchanger can be disassembled and done maintenance for the future.

Special Gasket Material -HNBR

HNBR (Hydrogenated Nitrile Butadiene Rubber) is achieved by hydrogenated NBR which has excellent heat and oil resistance, improved fuel, ozone resistance and good abrasion resistance over standard NBR. HNBR is widely known for its physical strength and retention of properties after long-term exposure to heat, oil, and chemicals. Compounding techniques allow for HNBR to be used over a broad temperature range, Up to 150°C, with minimal degradation over long periods of time.

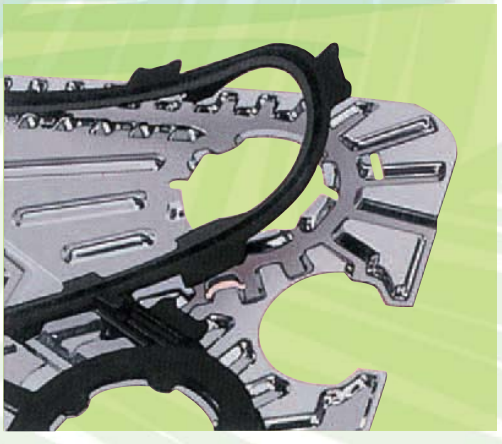


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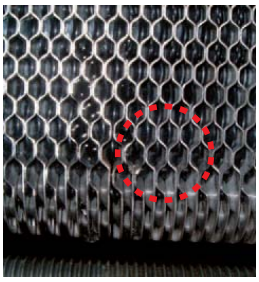
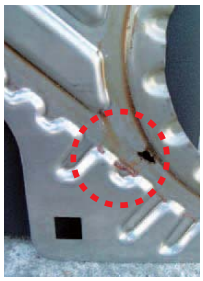
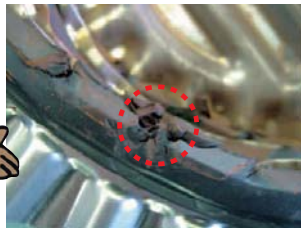
Plate Heat Exchanger is high-performance and trouble free but... Periodic maintenance is necessary to secure the operation.

Watch the operating condition

1. Leakage of fluids due to deterioration of the gaskets
2. Decreasing thermal performance due to depsoits and fouling on plate surface
3. Intermixing of the fluids due to corrosion, crack and pin hole on the plates

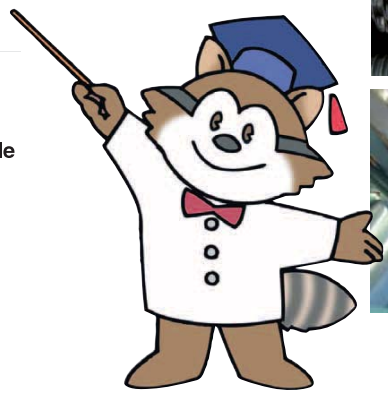




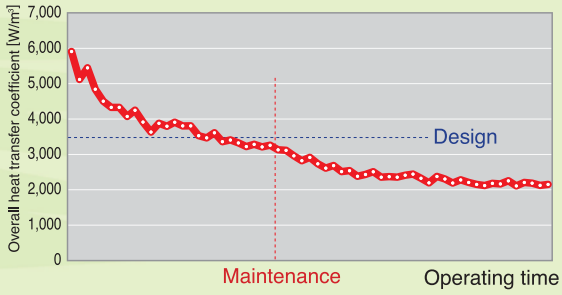


Professional maintenance work can prevent :

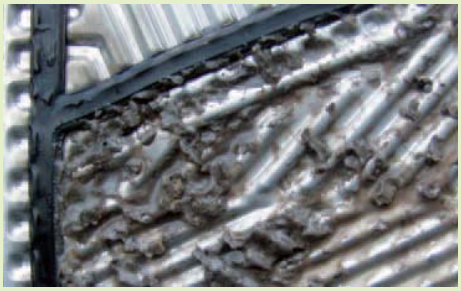
4. The deformation or damage to plates by unreasonable opening and tightening
5. Insufficient cleaning of plate
6. Tiny corrosion, crack and pin holes of the plates may be overlooked



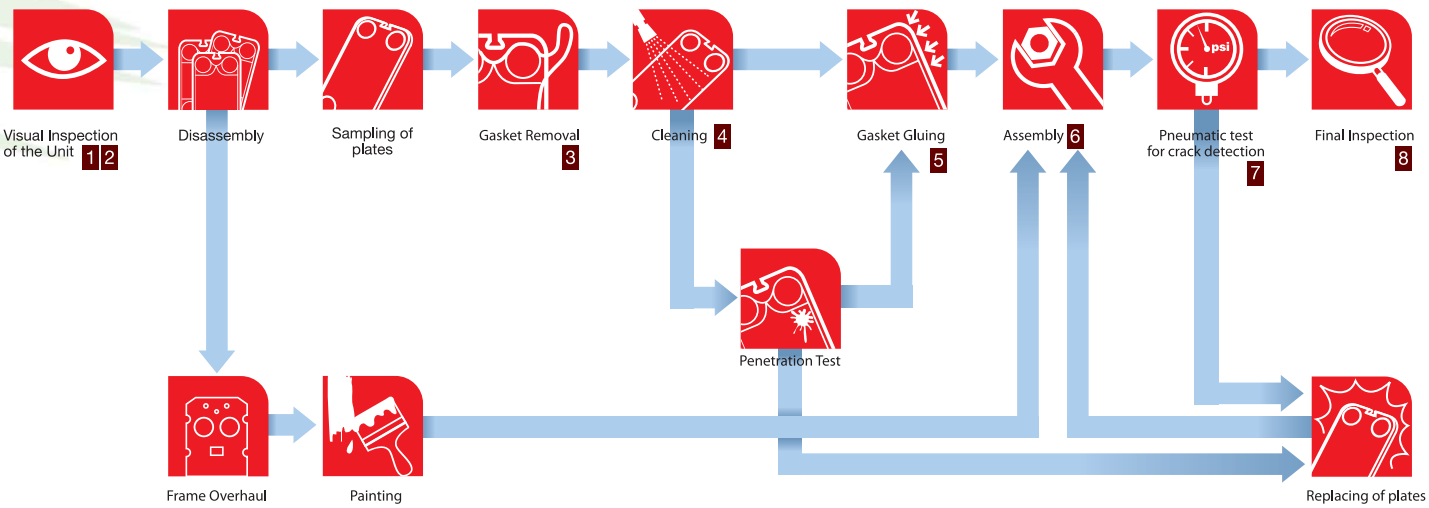
Changing of overall heat transfer coefficient



Thermal performance will be decreased as time goes on by deposit and fouling on the plate after long time operation.



Full Package Services Flow



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