

Technical Bulletin #21

ITT Standard

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Date 07/11/06

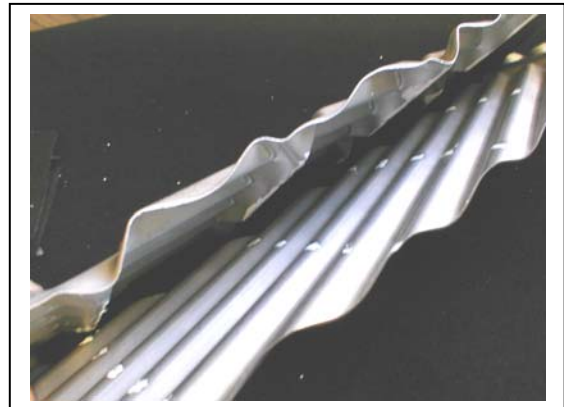
Subject: **Free Flow Models FP 53, FP101, FP123, FP131, FP 160 & FP229**

Free Flow units offer the same features of Plateflow Models, with the added benefit of exceptional clog-resistance for high fiber or coarse fiber applications.

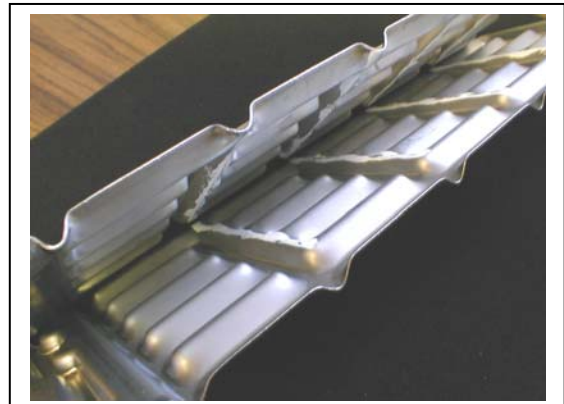
The ITT Standard Free-Flow Models FP53, FP101, FP123, FP131 & FP229 feature minimum metal to metal contact points between adjacent plates compared to many of our competitors. This greatly reduces the points for suspended material to adhere.

The Models FP53, FP101, FP123 FP131, FP160 & FP229 can handle fluids with particulate matter up to 6 mm in diameter with plate gaps up to 12mm.

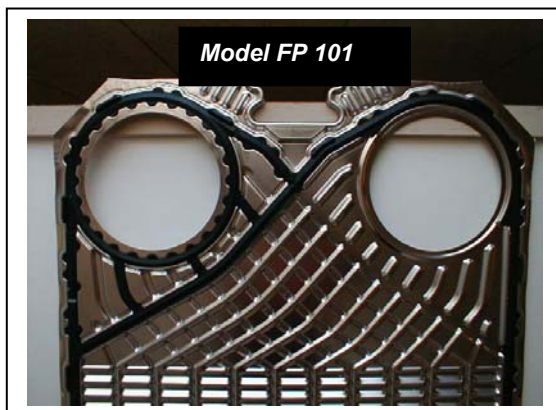
A typical competitors plate has approximately 68 contact points per square foot of surface area. The ITT Standard Models FP53, FP101, FP123, FP131, FP160 & FP229 has only 20 line contact points per square foot of surface area. Fewer contact points greatly reduces plugging with fibrous applications.

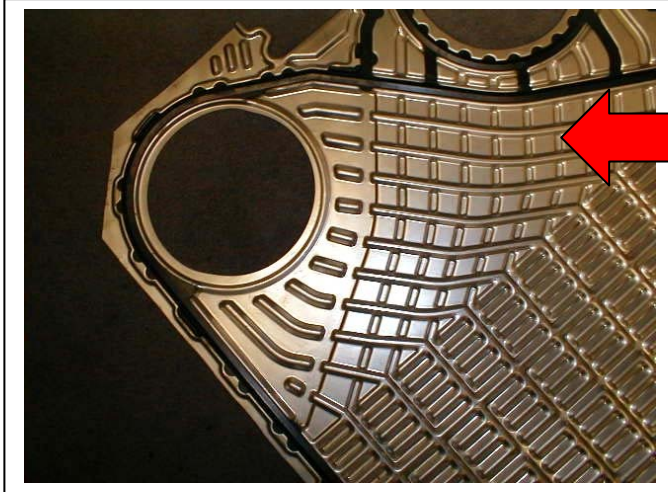


Typical Competitors Plate 68 Contact Pts./ Sq.Ft.



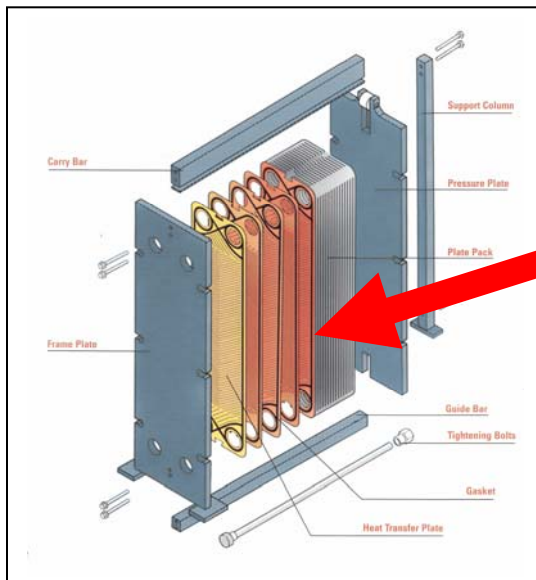
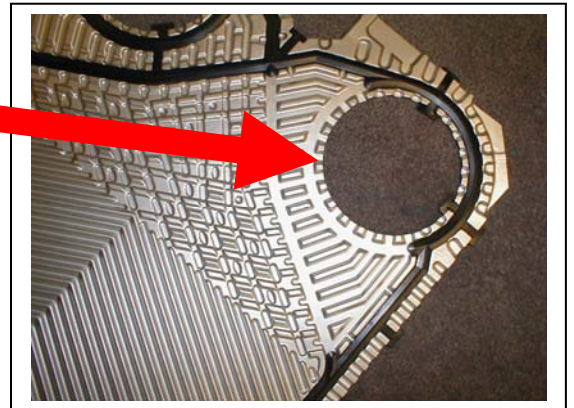
ITT Standard FP101 ONLY 20 Line Contact Pts./ Sq.Ft.





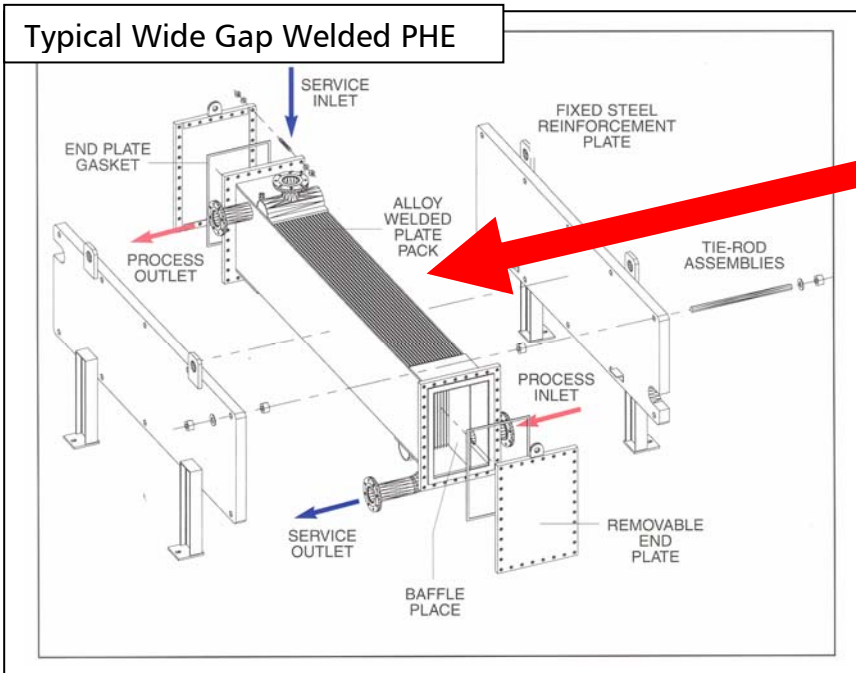
In addition to minimal metal to metal contact points, the ITT Standard FP models incorporate a free flow inlet and outlet port design. The smooth surfaces of the Model FP units port design greatly minimizes the potential for "clogging".

Inlet port region of a traditional gap plate provides high thermal performance however the scalloped edged port inlet and multiple contact points of the neck region of the plate are susceptible to "clogging".



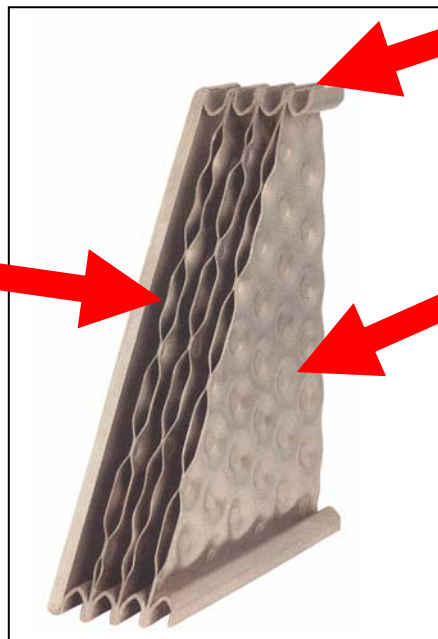
All gasketed Free Flow models can be disassembled for inspection of heat transfer surfaces, cleaning, repair, and for future expansion.

Typical Wide Gap Welded PHE



All welded construction does not allow for disassembly of the service side or process (wide gap) side of the heat exchanger. Inspection of service side heat transfer surfaces not possible. All welded construction does not allow for future expansion or repair.

Smooth heat transfer surfaces and extra wide gap (5/8") yield heat transfer coefficients lower than gasketed wide gap plate and frame heat exchangers and only slightly higher than shell and tube exchangers. Large numbers of welds is high in cost.



Large number of un-accessible heat transfer surface resistance welds and plate pack perimeter welds are more susceptible to corrosive attack and difficult to service

ITT Standard is a leading designer of heat transfer solutions providing shell and tube, air-cooled and plate type heat exchangers for the heating and cooling needs for a variety of industrial applications.

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Technical Bulletin #22

Plate Specifications

Date 01/17/05

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Subject: **Free Flow Plateflow Models FP25A FP 53, FP101, FP131, FP 160& FP229**

2" Port

ITT Standard FP25A Free Flow Plate Heat Exchanger

The FP25A ITT Standard Free Flow plate heat exchanger is specially developed for the Fruit Juice, Sugar and the General Industrial market that handles fluids which contain fibers and solids.

This plate has with its plate length of 1,3 m, the possibility to cover many duties in a single pass solution, which means that all the connections will be in the head of the heat exchanger, which is a big advantage during service work.

The plate pattern are designed without metal contact between the plates in the liquid area. The plate gab for this plate range is 5,0 mm between the plates.

The plate pattern and inlet area are also designed for CIP Cleaning, which makes the service of the PHE easy.

Plates:

Standard material:
AISI 316 and Titanium
Not standard: 254 SMO, Hastelloy and other pressable materials.

Gaskets:

The gaskets are the unique "Lock" gasket. The "Lock" gasket, locks the plates together with strong rubber buttons, so that the plates are strongly guided during the assembling of the plate heat exchanger.

Standard material: Nitrile and EPDM.
Not standard: Viton.





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4" Port

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FP53 Free Flow Plate Heat Exchanger

The FP53 ITT Standard Free Flow plate heat exchanger is specially developed for the Fruit Juice, Sugar and the General Industrial market that handles fluids which contain fibers and solids.

This plate has with its plate length of 1,6 m, the possibility to cover many duties in a single pass solution, which means that all the connections will be in the head of the heat exchanger, which is a big advantage during service work.

The plate pattern are designed without metal contact between the plates in the liquid area. The plate gap for this plate range is 5,4 mm between the plates.

The plate pattern and inlet area are also designed for CIP Cleaning, which makes the service of the PHE easy.

Plates:

Standard material:

AISI 316

Not standard: 254 SMO, Hastelloy and other pressable materials.

Gaskets:

The gaskets is the unique "Lock" gasket.

The "Lock" gasket, locks the plates together with strong rubber buttons, so that the plates are strongly guided during the assembling of the plate heat exchanger.

Standard material: Nitrile and EPDM.

Not standard: Viton.



8" Port

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FP101 FP131 FP229 Free Flow Plate Heat Exchanger

The FP101, FP131 and FP229 range of ITT Standard Free Flow plate heat exchangers are specially developed for the Pulp and paper, Sugar and the General Industrial market that handles fluids which contain fibers and solids. This plate range has with its plate length from 1,8 m to 3,5 m, the possibility to cover almost all duties in a single pass solution, which means that all the connections will be in the head of the heat exchanger, which is a big advantage during service work.

The plate pattern are designed without metal contact between the plates in the liquid area. The plate gap for this plate range is 6 mm between the plates.

The plate pattern and inlet area are also designed for CIP cleaning, which makes the service of the PHE easy.

Plates:

Standard material:

AISI 304, AISI 316 and Titanium

Not standard: 254 SMO, Hastelloy and other pressable materials.

Gaskets:

The gaskets is the unique "Lock" gasket.

The "Lock" gasket, locks the plates together with strong rubber buttons, so that the plates are strongly guided during the assembling of the plate heat exchanger.

Standard material: Nitrile and EPDM.

Not standard: Viton.





12" Port

ITT Standard FP160 Free Flow Plate Heat Exchanger

The **FP160 ITT Standard Free Flow** plate heat exchanger is specially developed for the Pulp and paper, Sugar and the General Industrial market that handles fluids which contain fibers and solids.

This plate has with its plate length of 2,4 m, the possibility to cover many duties in a single pass solution, which means that all the connections will be in the head of the heat exchanger, which is a big advantage during service work.

The plate pattern are designed without metal contact between the plates in the liquid area. The plate gab for this plate range is 10 mm between the plates.

The plate pattern and inlet area are also designed for CIP cleaning, which makes the service of the PHE easy.

Plates:

Standard material:

AISI 304 and AISI 316

Not standard: 254 SMO, Hastelloy and other pressable materials.

Gaskets:

The gaskets is the unique "Lock" gasket.

The "Lock" gasket, locks the plates together with strong rubber buttons, so that the plates are strongly guided during the assembling of the plate heat exchanger.

Standard material: Nitrile and EPDM.

Not standard: Viton.

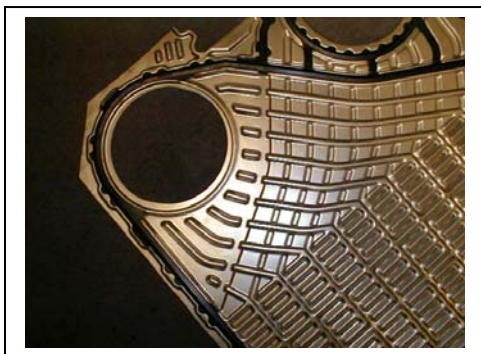


Date 02/06/06

Subject: Black Liquor in FP Plateflow Heat Exchangers

Black Liquor is a byproduct of the reaction of wood chips and White Liquor (NaOH and Na₂S). Black liquor contains Alkali Lignin, Hydrolysis Salts and Sulphonation Products. These components of Black Liquor have a high-suspended solids content and proper selection of the Gasketed Plate Heat Exchanger is important. The use of ITT Standard FreeFlow Plateflow Heat Exchangers with Black Liquor in a typical Kraft Pulping Process can be accomplished. Some design factors to consider are as follows:

- Use FreeFlow Models FP 101 and higher. These models offer plate to plate flow cross sections designed to handle solids content associated with flow streams like Black Liquor.



- The FreeFlow Models should be designed with a maximum overall heat transfer coefficient of 440 BTU/Hr.Ft²F. Black liquor contains the reactive components of the wood chips and the White Liquor (NaOH and Na₂S). These components have a controlling factor in the maximum achievable overall heat transfer coefficient.
- Both EPDM and Nitrile gaskets have been used successfully with Black Liquor but because of the variations in the reactive components present in Black Liquor based on the unique operating conditions of each process, the gaskets should be specified by the end user.



Use of the FreeFlow models has been accomplished at Metsä-Serla Tako Paper Mill and Metsä-Rauma Pulp Mill of Finland.

For additional information contact ITT Standard at www.ittstandard.com.