Alfa Laval PCHE

The printed circuit heat exchanger

Introduction

Alfa Laval printed circuit heat exchangers (PCHEs) combine superior robustness and integrity with exceptionally high heat transfer rate in a unit up to 85 % smaller and lighter than traditional shell and tube exchangers. The unique design results in excellent performance, lower installation and operational costs, and improved safety. Each unit can be fully customized according to the exact needs of the customer.

Applications

The PCHE is designed specifically to deliver unparalleled compactness and efficiency in clean and high-pressure duties, that are beyond the capability of other welded plate type exchangers, with design pressures ranging from vacuum to 650 barG (9,430 psiG).

Benefits

- Exceptional savings in footprint, volume, weight and structural support costs
- Very wide capacity range
- Design temperatures from cryogenic to 800°C (1,472°F) and design pressures up to 650 barG (9,430 psiG)
- Exceptionally high heat transfer rate for maximum operating efficiency
- Safe to operate – no pressure relief valve needed
- Easy maintenance ensures maximum uptime
- Diffusion bonding opens up for full customization possibilities in terms of fluid channel design pattern

Working principle

The PCHE operates with two or more media on opposite sides of a bonded plate. It is possible to have high-pressure flows on both sides. The 2D or 3D pattern is optimized to give the required thermal length and pressure drop.

The PCHE has a complex flow pattern chemically etched on flat sheets of material. This flow pattern is optimized for each specific customer duty to give the required thermal and hydraulic characteristics. Each flow circuit plate pattern can be different, giving the possibility of asymmetric flows and optimized 2-phase behavior. The individual plates are then stacked into a block and diffusion bonded, in a state-of-the-art furnace, at high temperature and pressure.

Multiple blocks can be welded together to create the required thermal capacity or HTA (heat transfer area). Inlet and outlet flow manifolds, customer connections and (if required) connections for drain, ventilation or cleaning are welded onto the completed core to finalize the heat exchanger. Design pressures of up to 650 barG (9,430 psiG) in 316L SST are achievable with this configuration. Heat transfer surface areas are tailored based on requirements.

Design

3DPlate ™

Prevents clogging under freezing conditions

A patented 3D plate pattern maintains high efficiency and maximum uptime when using water-based fluids like glycols in cryogenics applications

OptiBond ™

A robust and compact solution for high-pressure needs

State-of-the-art diffusion bonding technology provides the highest durability and thermal efficiency within an ultra-compact welded plate heat exchanger.

Learn more at **www.alfalaval.com/pche**

Technical data

Design pressure:	
CE/PED	Vacuum to 650 barG (9,430 psiG)
ASME	Vacuum to 650 barG (9,430 psiG)

Design temperature:	
316L SST	-196°C (-321 °F) to 800°C (1472 °F)

Maximum heat transfer area:

On request tailored towards requirements

Connections:

DN50 (2”) to DN750 (30”) typical, customizable

Standard materials:

316L SST

Other materials available on request.

Dimensions and weights:

On request tailored towards requirements, ranging from a few kilograms to tens of tons

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How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com