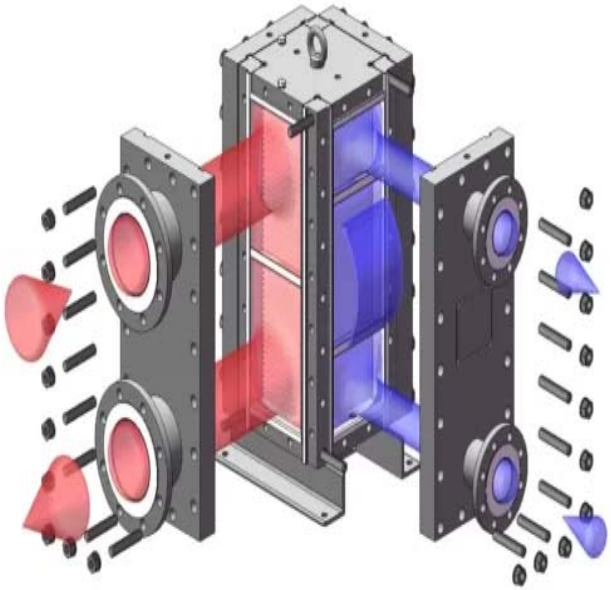
PLATE AND FRAME HEAT EXCHANGER

Enppi

Engineering for the Petroleum and Process Industries

Plate and Frame Heat Exchanger

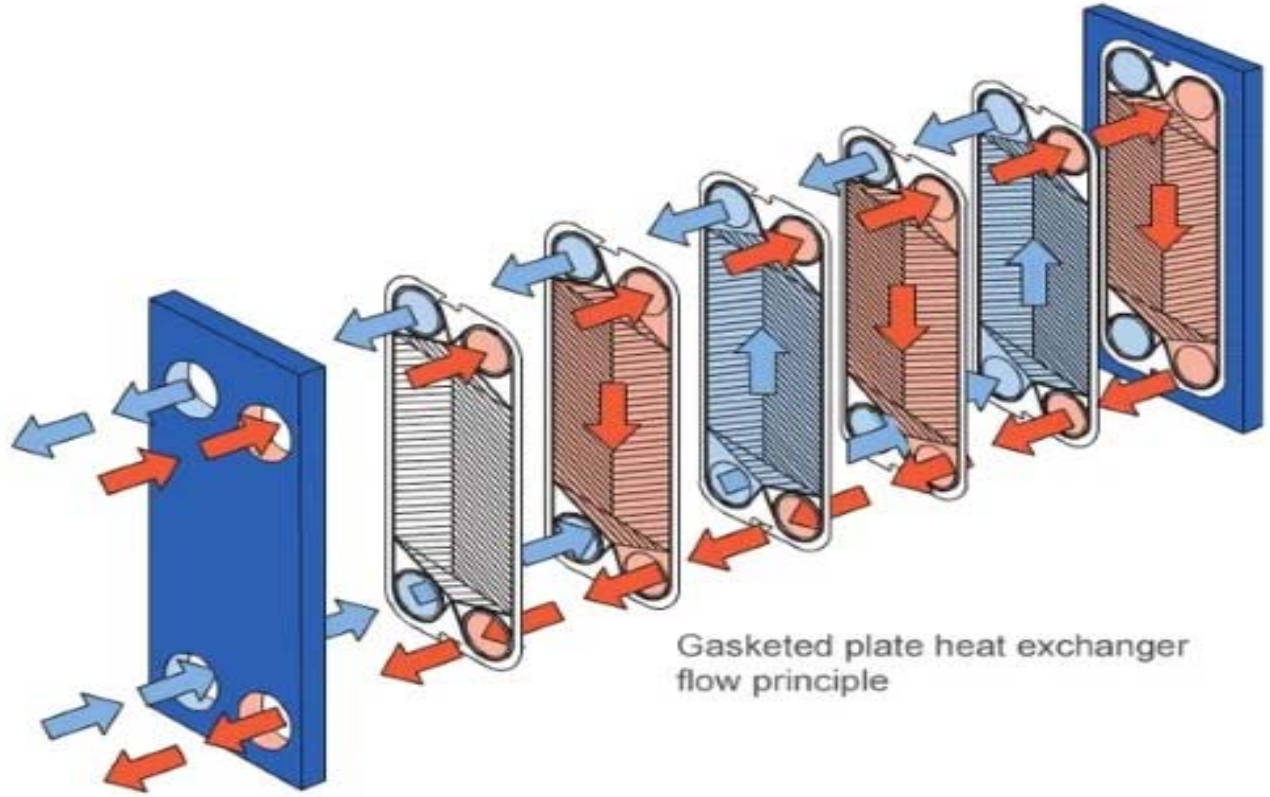
- Gasketed
- Semi Gasketed
- Welded



Enppi

PLATE AND FRAME HEAT EXCHANGERS

- Design Codes:
  - ASME Code Sec. VIII.
  - API-667. Replace API 662, Part-1

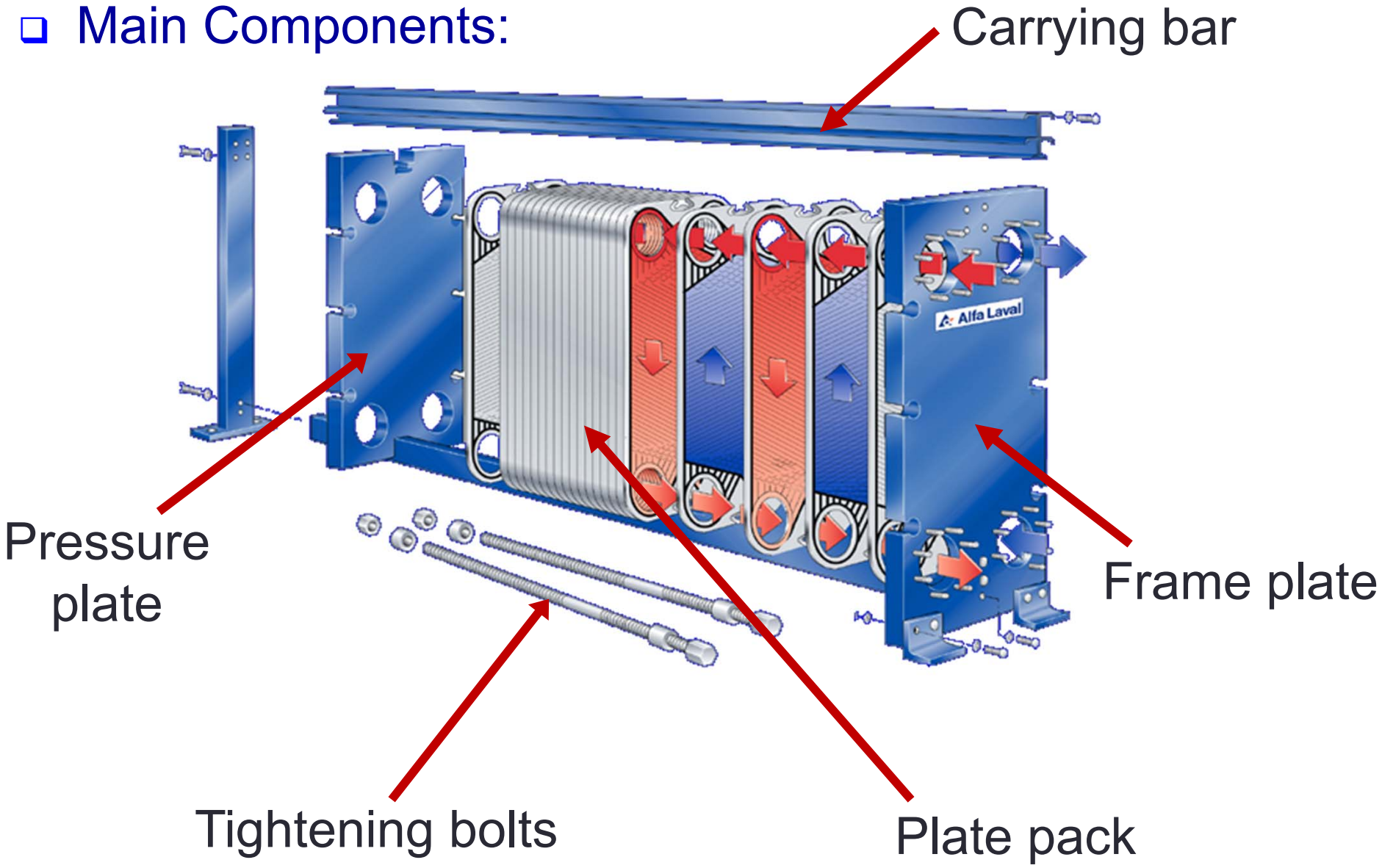


Gasketed plate heat exchanger flow principle

Enppi

PLATE AND FRAME HEAT EXCHANGERS

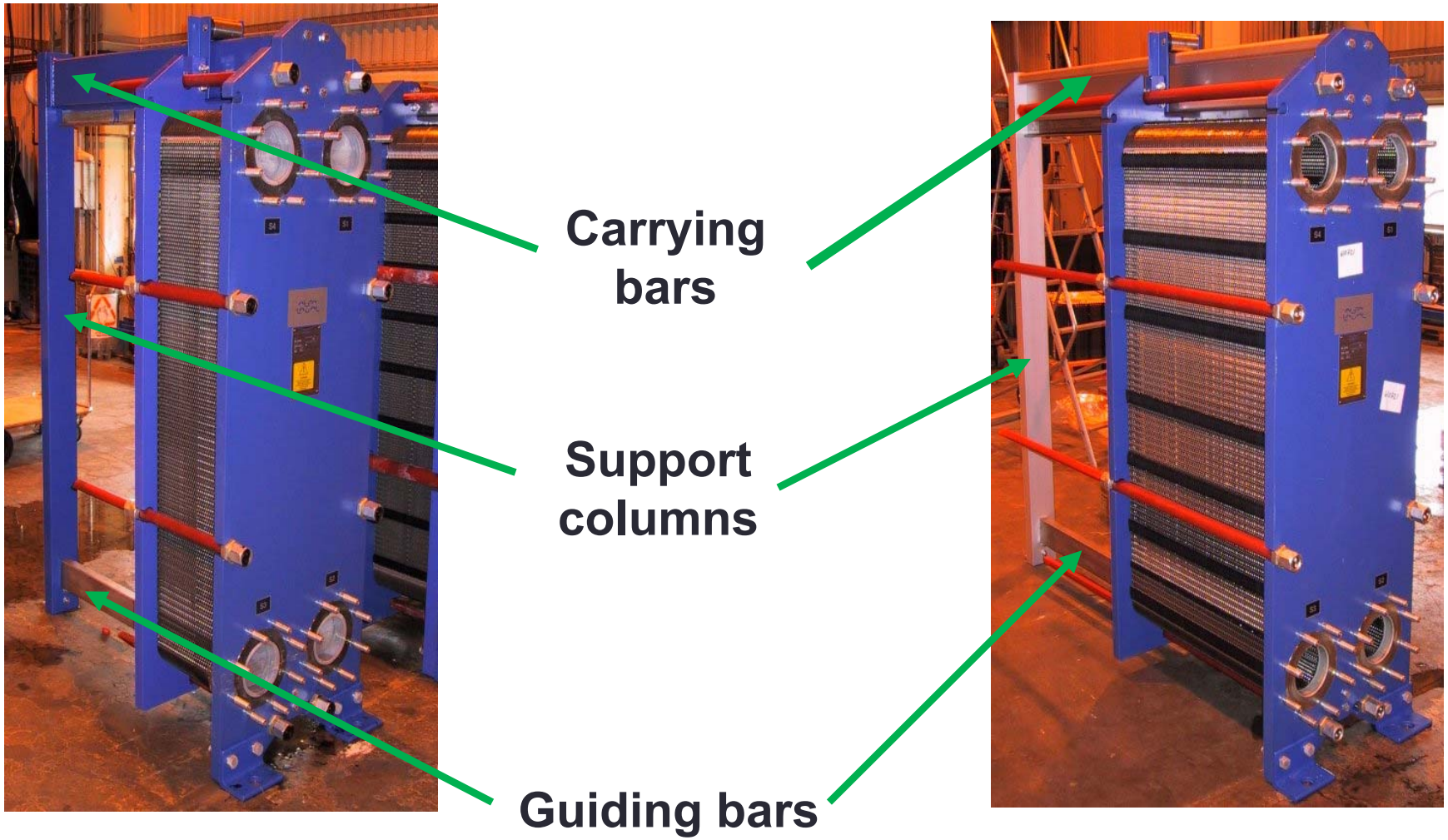
- Main Components:



Enppi

PLATE AND FRAME HEAT EXCHANGERS

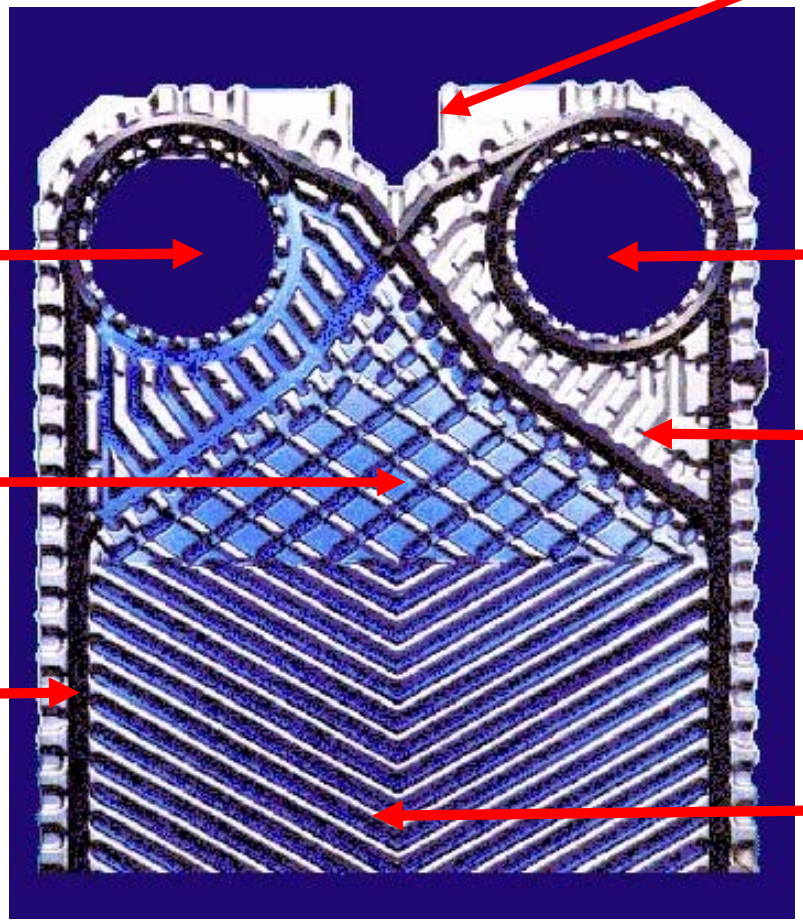
- Frame



Enppi

PLATE AND FRAME HEAT EXCHANGERS

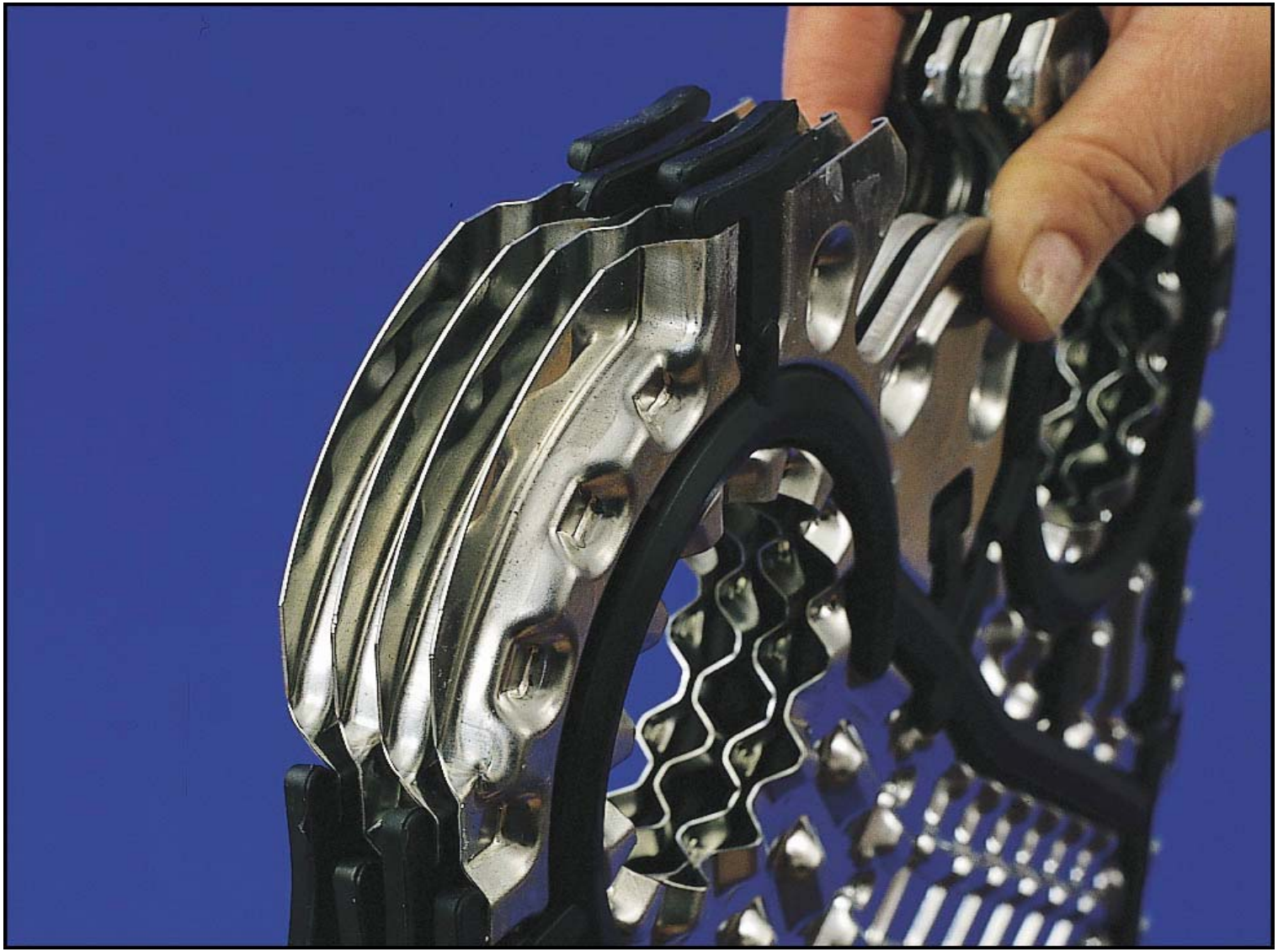
- Plate (Main Component)



Enppi

PLATE AND FRAME HEAT EXCHANGERS

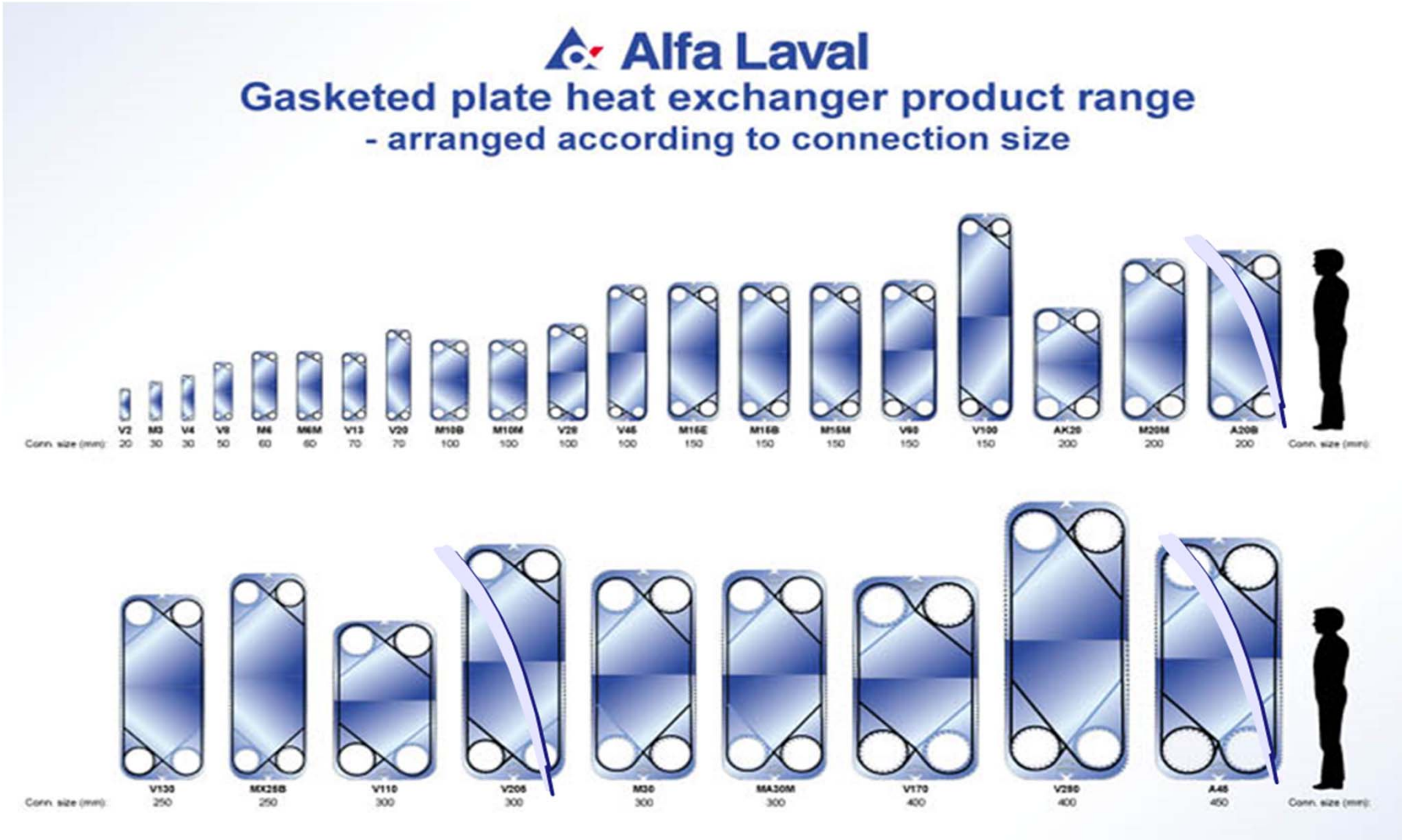
- Stacking of Plates



Enppi

PLATE AND FRAME HEAT EXCHANGERS

- Plates



Enppi

PLATE AND FRAME HEAT EXCHANGERS

- Plates geometries

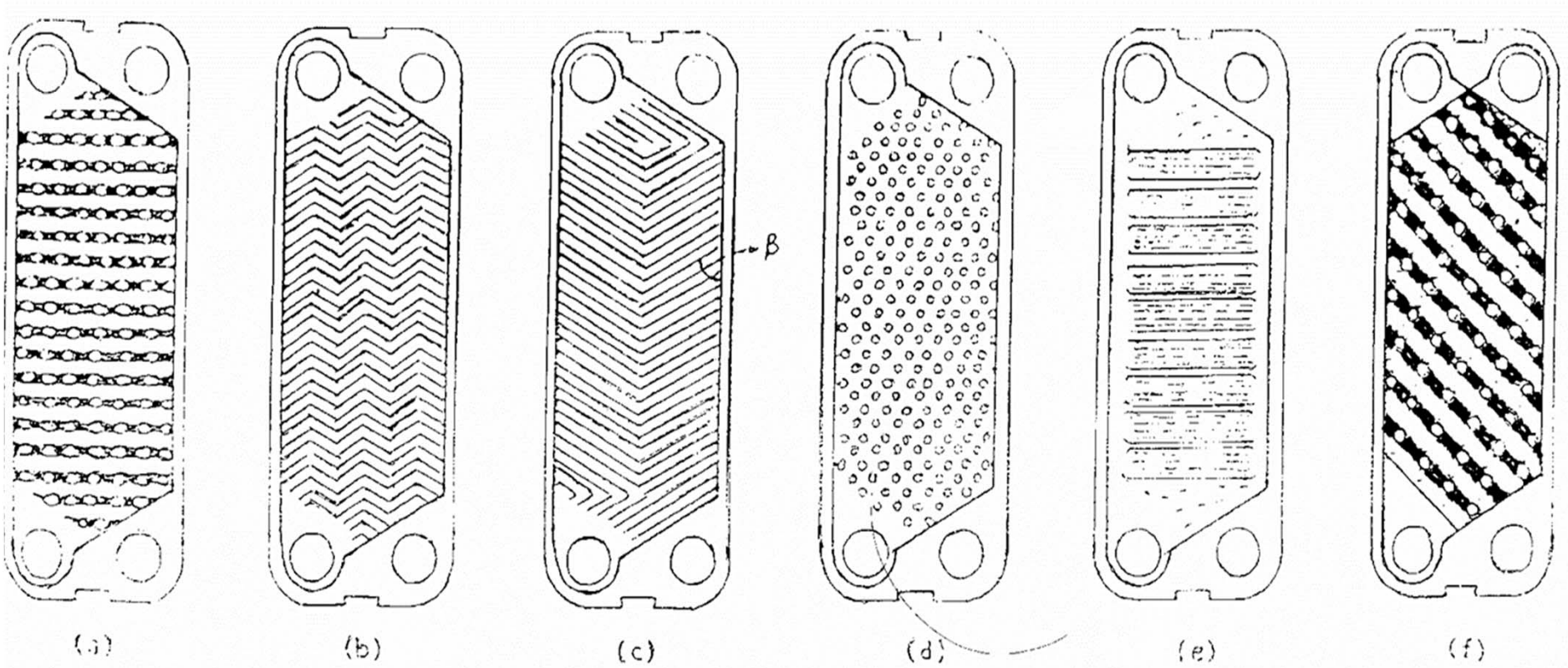


FIG. 7. PLATE PATTERNS:

(a) WASH BOARD (b) ZIG-ZAG (c) CHEVRON OR HERRINGBONE (d) PROTRUSIONS AND DEPRESSIONS (e) WASH BOARD WITH SECONDARY CORRUGATIONS, AND (f) OBLIQUE WASHBOARD.

Enppi

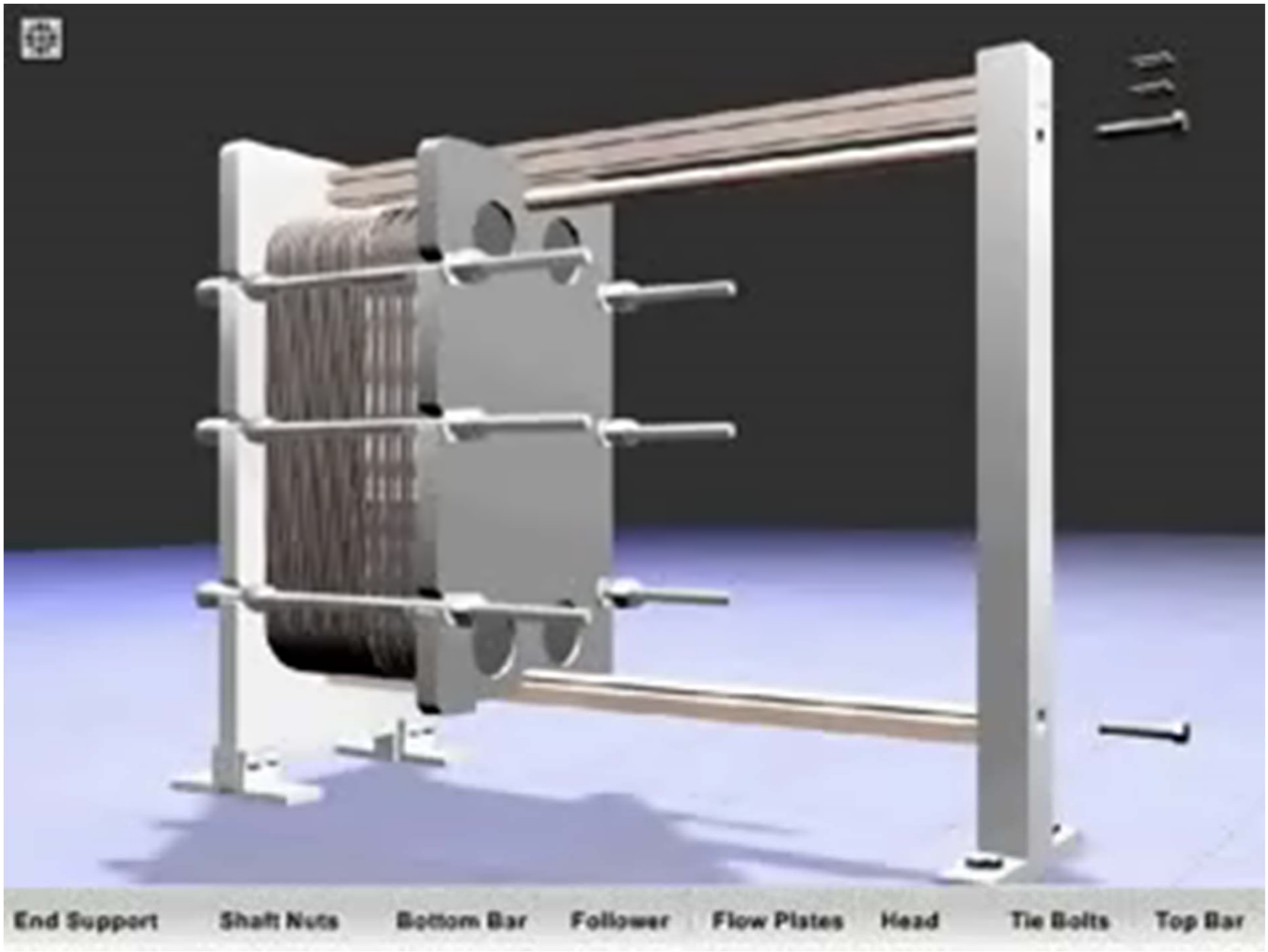
PLATE AND FRAME HEAT EXCHANGERS

- Plate Materials
  - AISI 304/316 (stainless steel)
  - Titanium
- Gasket Material Commonly used
  - Natural rubber (NR)
  - Styrene-butadiene-Rubber SBR
  - Ethylene Propelene Diene Monomer (EPDM)

PLATE AND FRAME HEAT EXCHANGERS

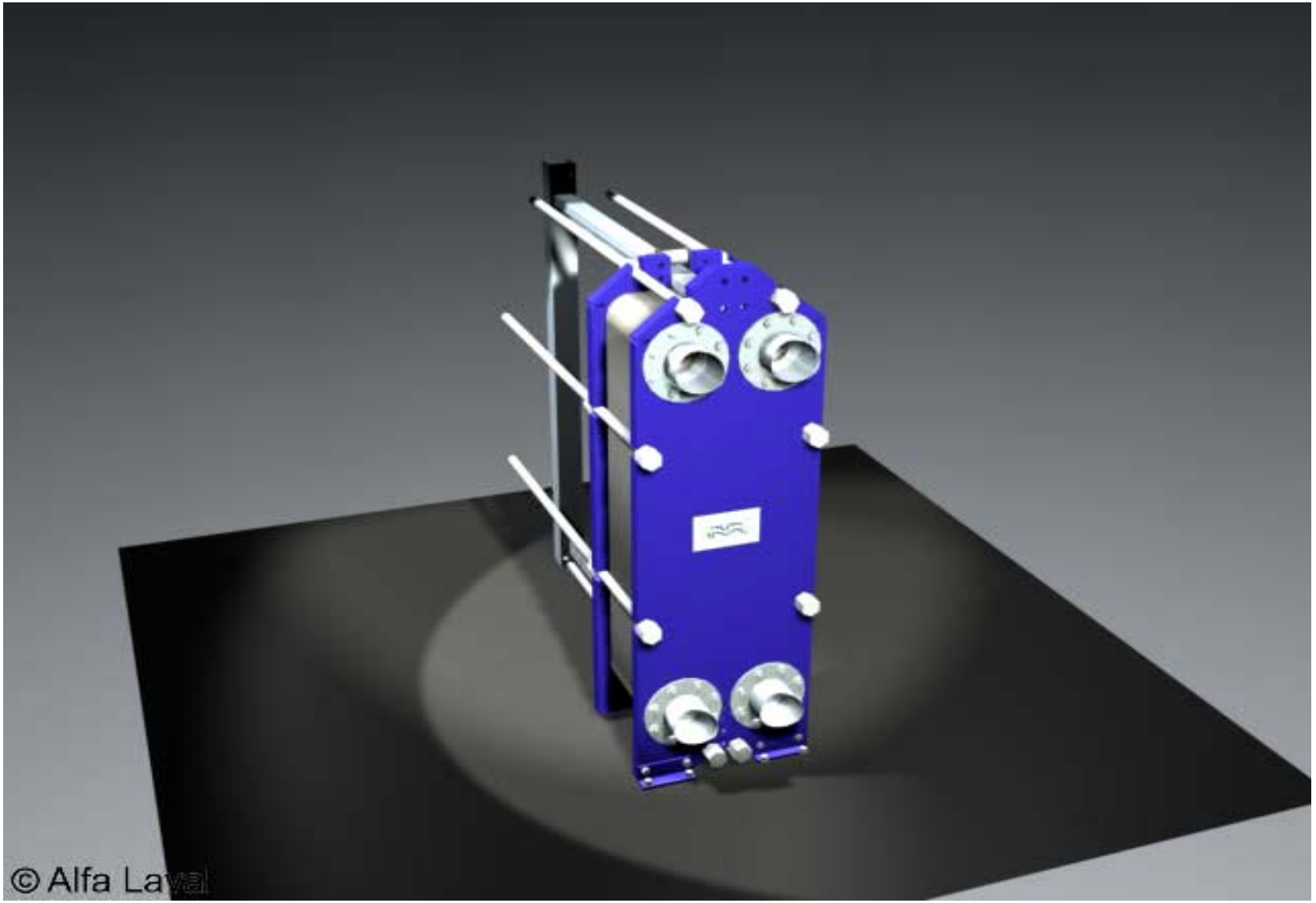
- Advantages:
  - Compact size
    - Less weight and plot space (ideal for off-shore)
  - Flexible designs (20% surface area expansion is standard)
  - Low equipment costs (often 25 to 50% of shell and tube exchanger)

PLATE AND FRAME HEAT EXCHANGERS



Enppi

PLATE AND FRAME HEAT EXCHANGERS

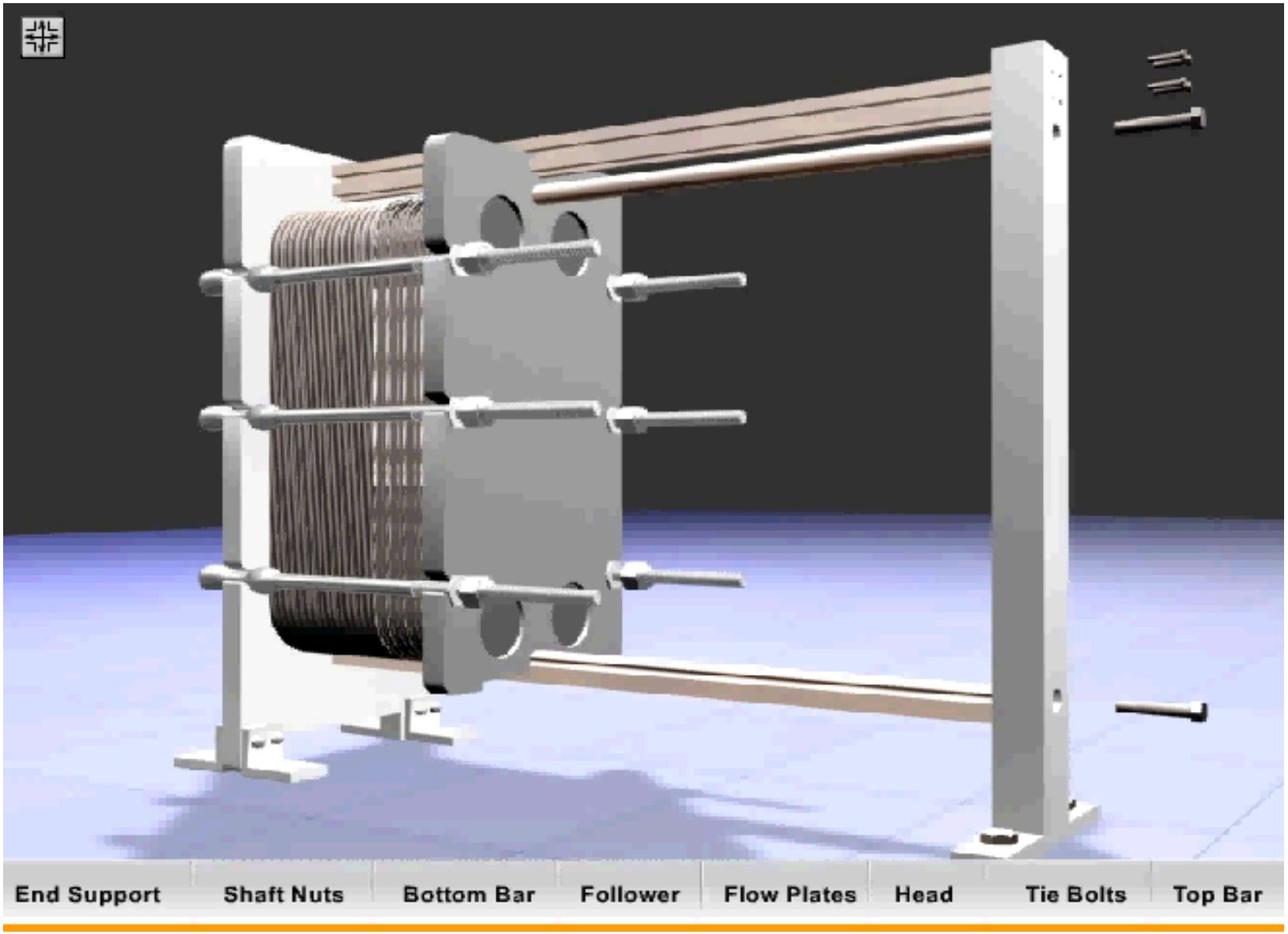


Enppi

PLATE AND FRAME HEAT EXCHANGERS

Enppi

PLATE AND FRAME HEAT EXCHANGERS



Enppi

PLATE AND FRAME HEAT EXCHANGERS

Adobe Acrobat Document

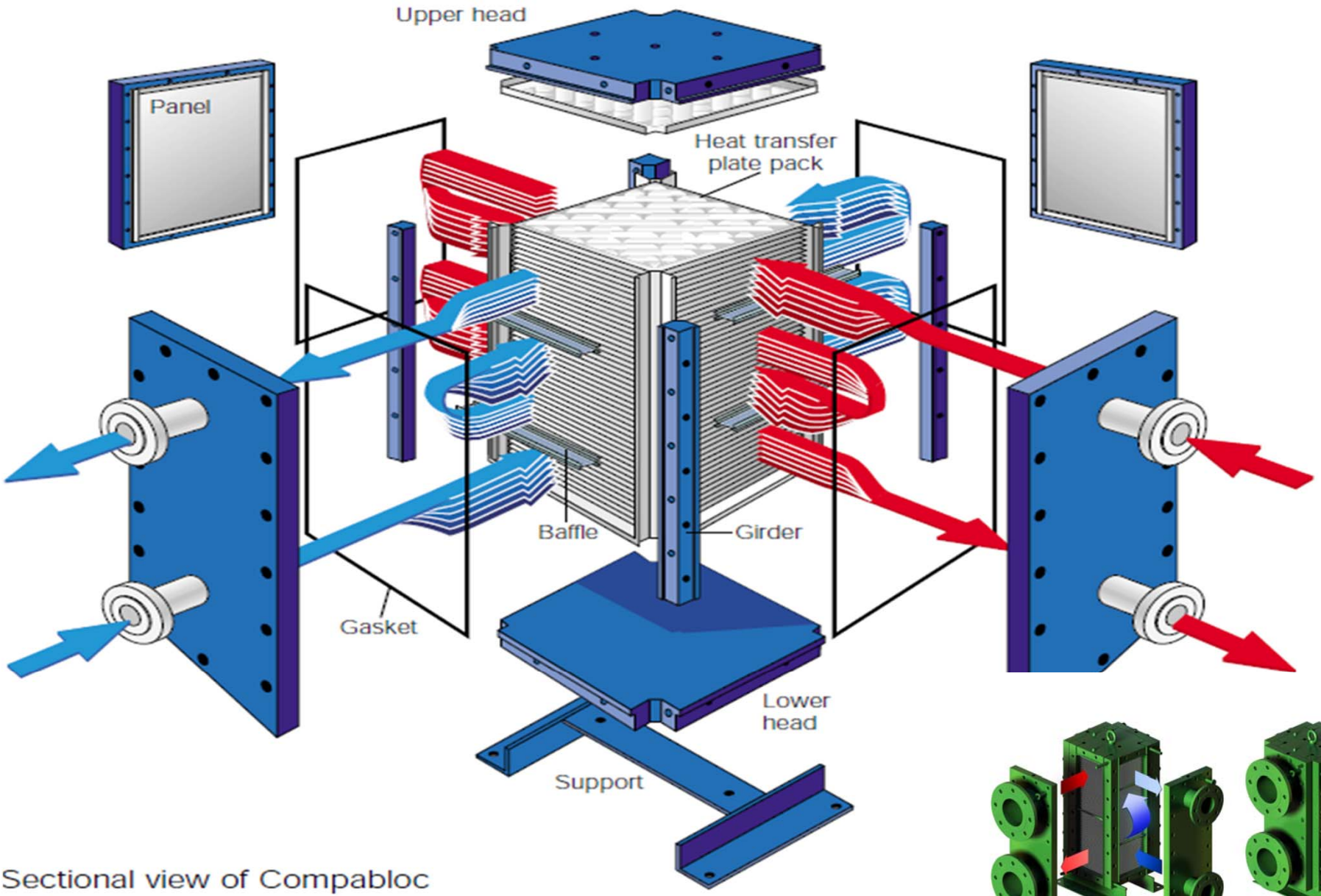
Enppi

WELDED PLATE HEAT EXCHANGER

Enppi

Engineering for the Petroleum and Process Industries

WELDED PLATE HEAT EXCHANGERS



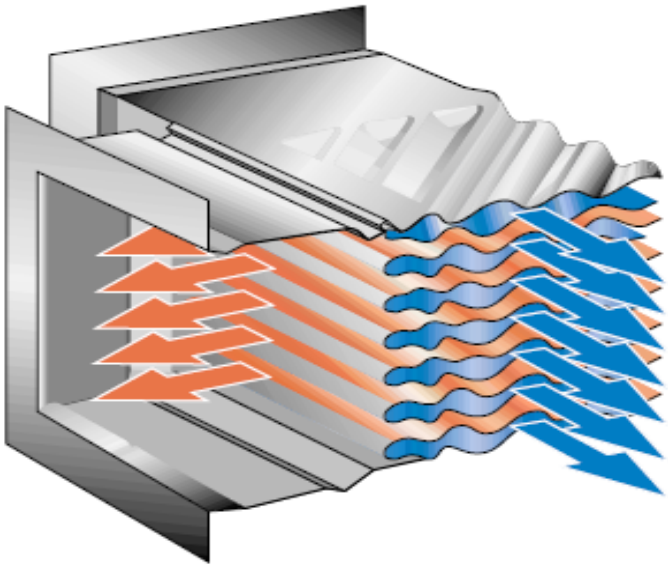
Sectional view of Compabloc

Enppi

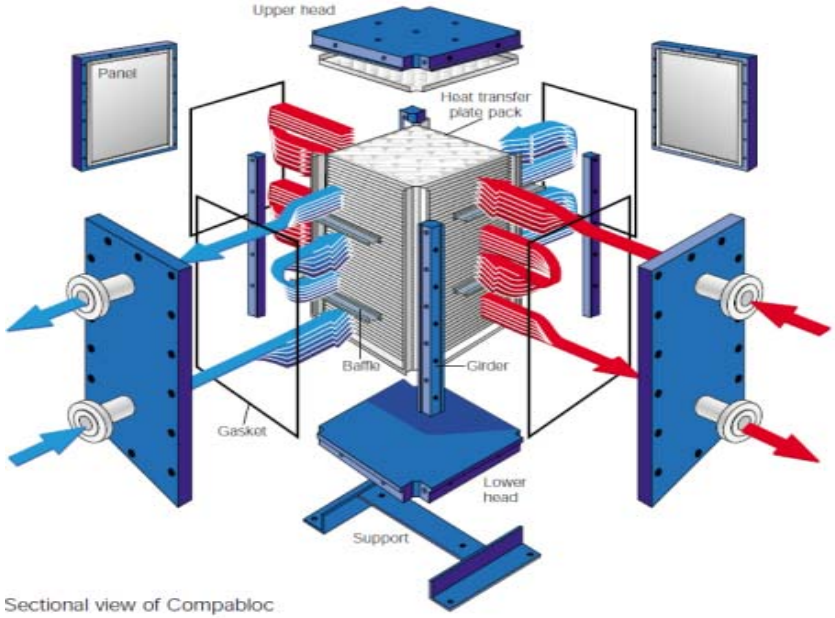
WELDED PLATE HEAT EXCHANGERS

- The heart of exchanger is a stack of corrugated plates.
- The two media flow in alternately welded channels between the corrugated plates.

Flow Path



Cross Flow



Sectional view of Compabloc

Counter Current Flow

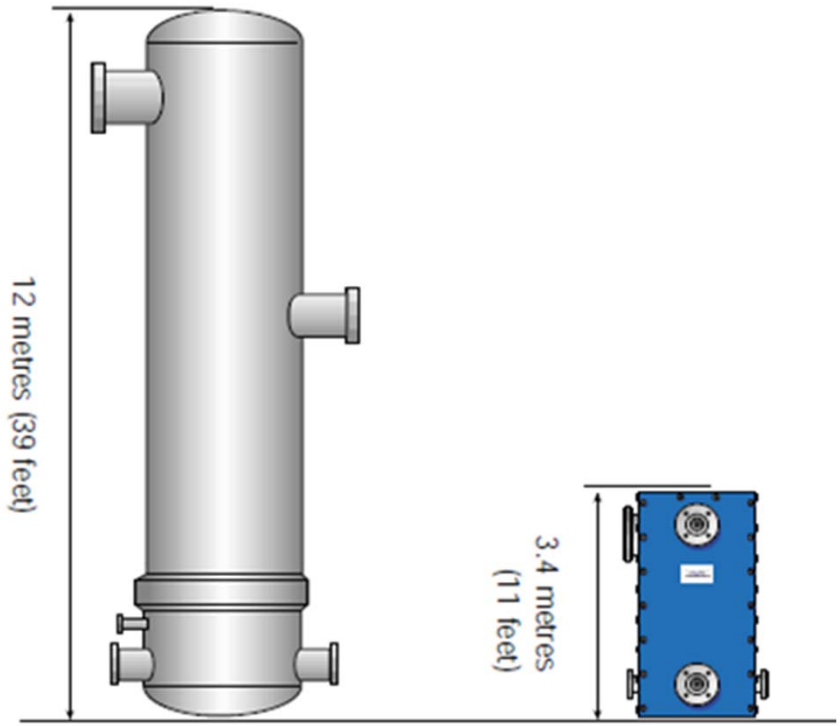
Enppi

WELDED PLATE HEAT EXCHANGERS

- Plate Welding
  - Welded by laser welding.
    - The advantage of laser welding is that the weld is thinner and more accurate, and the heat input is substantially reduced.
  - Advantages
    - Improves Reliability,
    - Extends the working life.

WELDED PLATE HEAT EXCHANGERS

- Advantages:
  - No gaskets between plates –allows operating:
    - with aggressive media.
    - at higher temperatures and pressures
  - Compact design compared to S &T H.Ex for the same
    - Flexible designs (20% surface area expansion is standard)



Compabloc vs. shell-and-tube (same duty).

Enppi

WELDED PLATE HEAT EXCHANGERS

Enppi

WELDED PLATE HEAT EXCHANGERS

Adobe Acrobat Document

Enppi