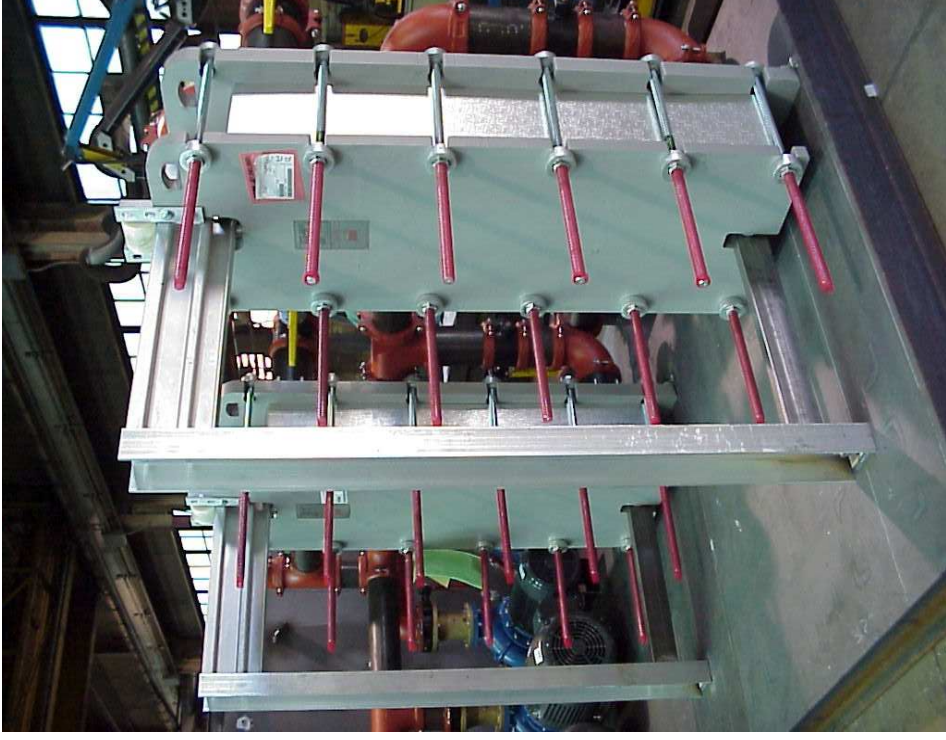




PRO.THERM
PROCESS AND THERMAL SYSTEMS
**STEAM GENERATION, HEAT TRANSFER
& ENERGY CONSERVATION SPECIALISTS**

Plateflow Plate Heat Exchangers

- **Maximum Thermal Efficiency**
- **Optimized Performance Rating**
- **Multiple Sizes**
- **Maximum Heat Transferred**
- **Low Initial Cost**
- **Expandable**
- **Cleanable**
- **Easy to Maintain**
- **Wide Gap Designs Available**



Protherm Corporation • 11108 South Towne Square • St. Louis, MO 63123-7813
(314) 894-6720 • FAX (314) 892-0107 • www.prothermcorp.com



ITT Plate Heat Exchangers

Plate Type Heat Exchangers

Simple Design

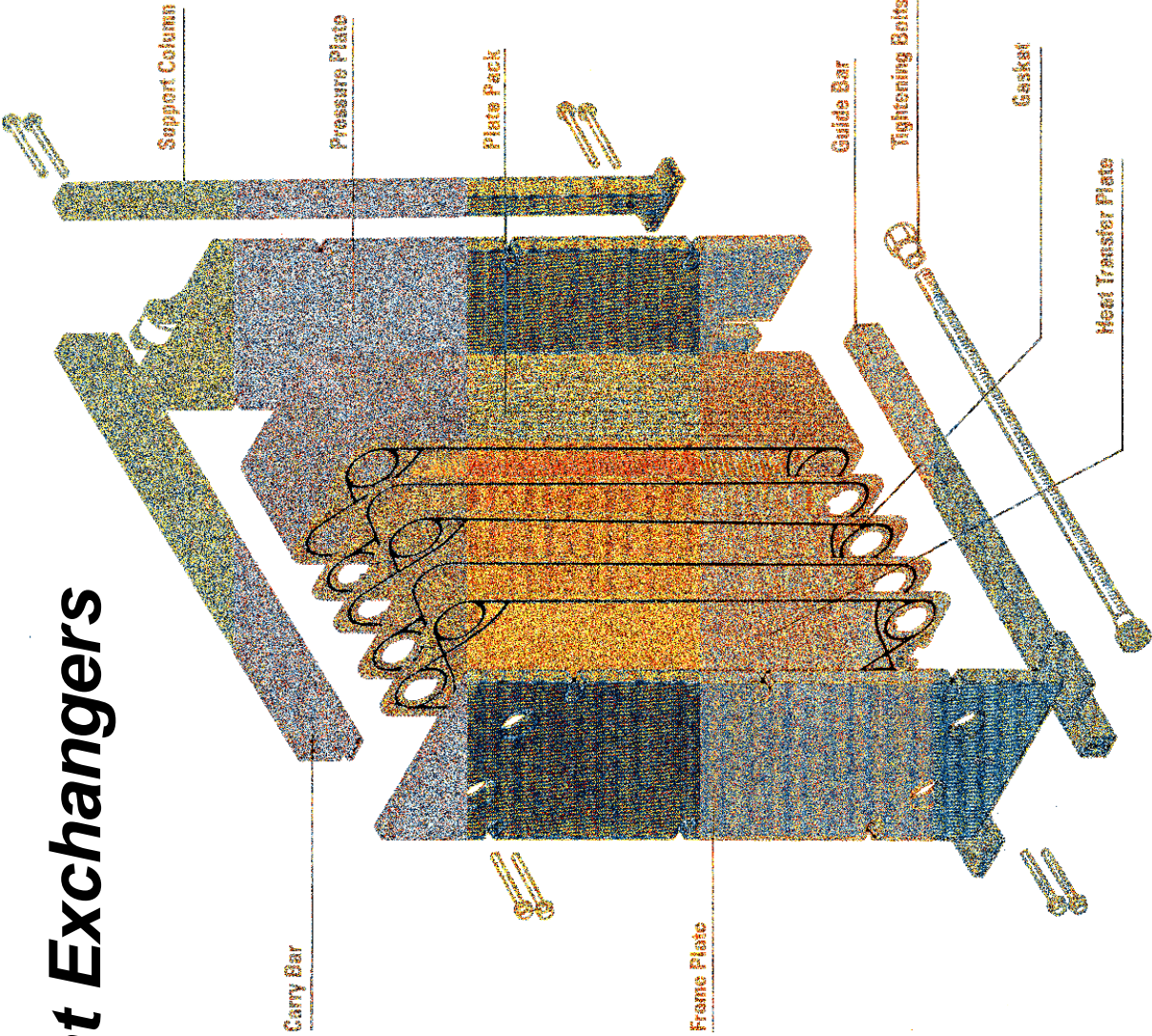


Plate Heat Exchangers Countercurrent Design Details

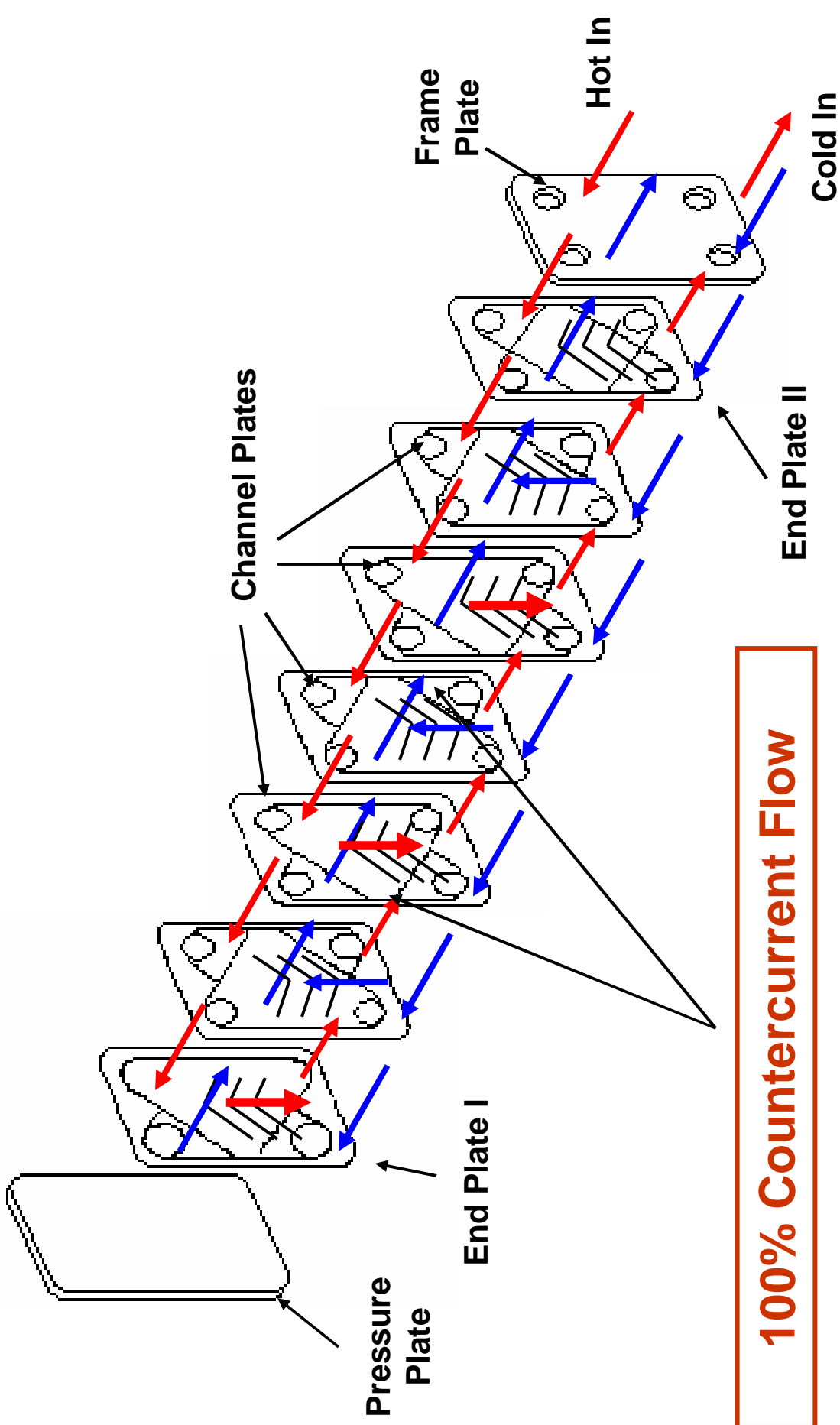
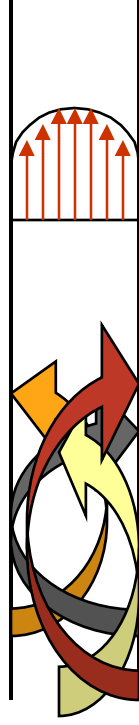


Plate Heat Exchangers Provide Maximum Efficiency

- Turbulence:
- High heat transfer rates (3-5 Times Shell & Tube)

Tube Turbulence $Re \sim 2100$

Vs



Turbulent Laminar

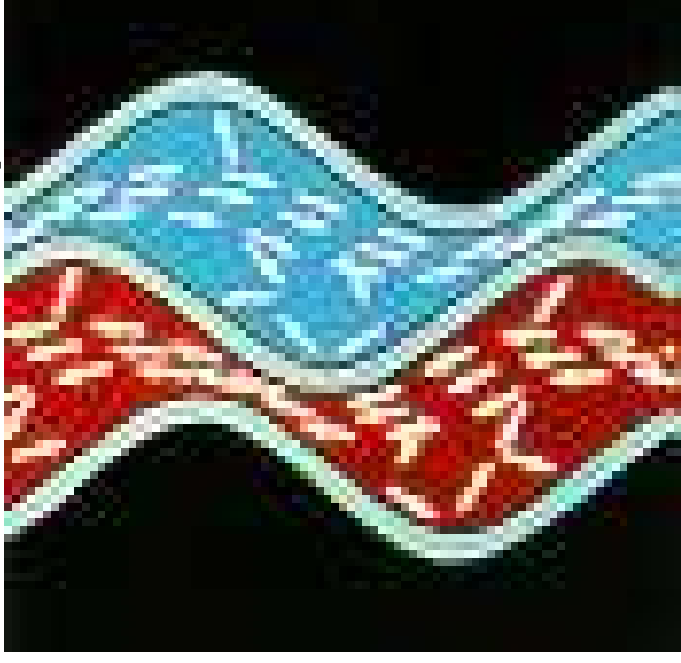


Plate Turbulence $Re \sim 125$

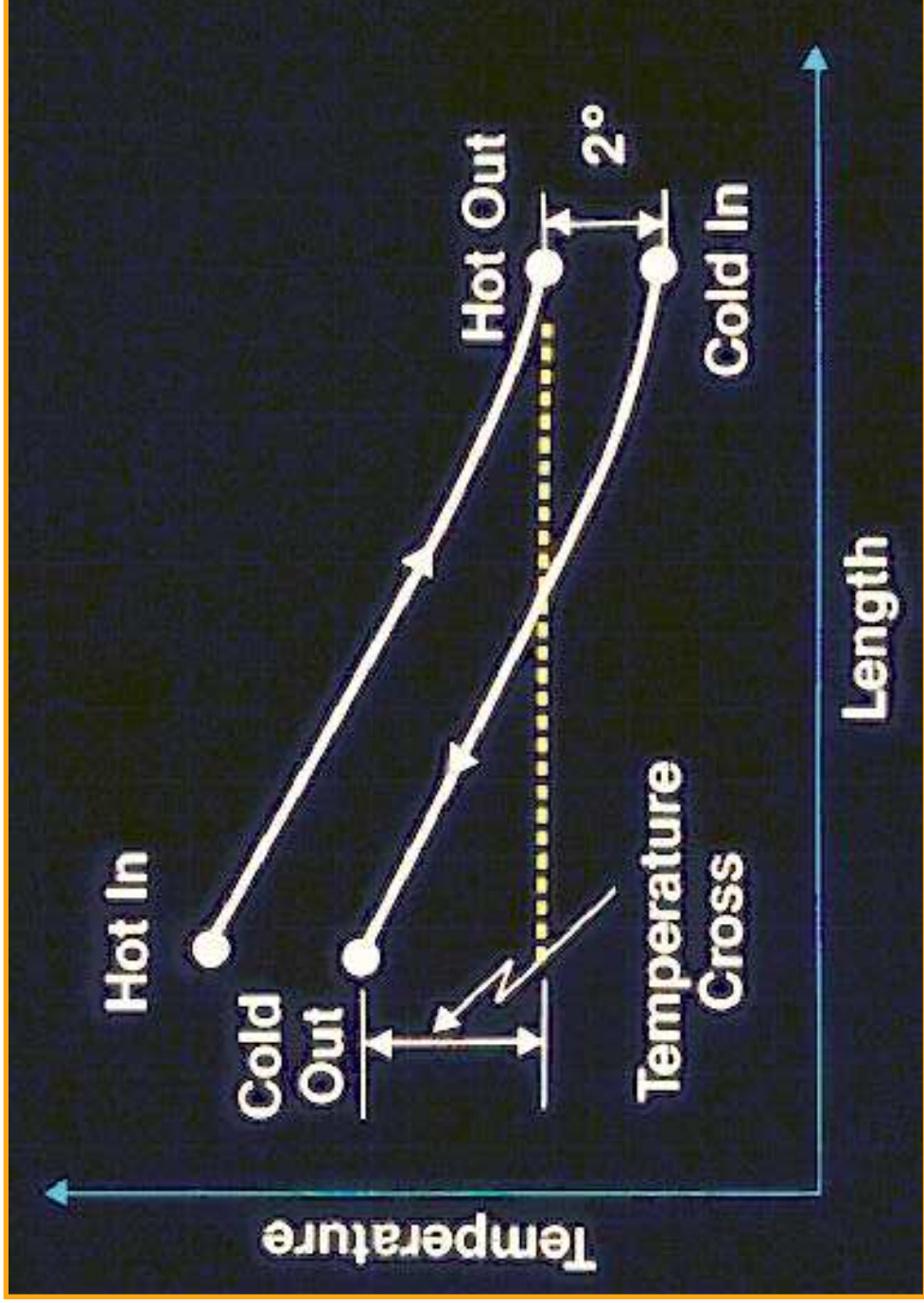


High Turbulence, Self Cleaning

- Plate exchangers operate with highly turbulent flow regimes.
- Turbulence creates a self cleaning effect minimizing fouling and scaling.



Temperature Cross, Close Approach



Plateflow Plate Heat Exchangers



- **Turbulent Flow**
- **True Countercurrent Flow**
- **High Transfer Rates
3-5 Times S&T**
- **1/3 -1/5 Surface Area**
- **Expandable**
- **Design Temperature 300F**
- **Design Pressure 300 psi**



Free-Flow Wide Gap Plate Heat Exchangers

- “Wide Gap” Designs
ITT Free-Flow



Vs.



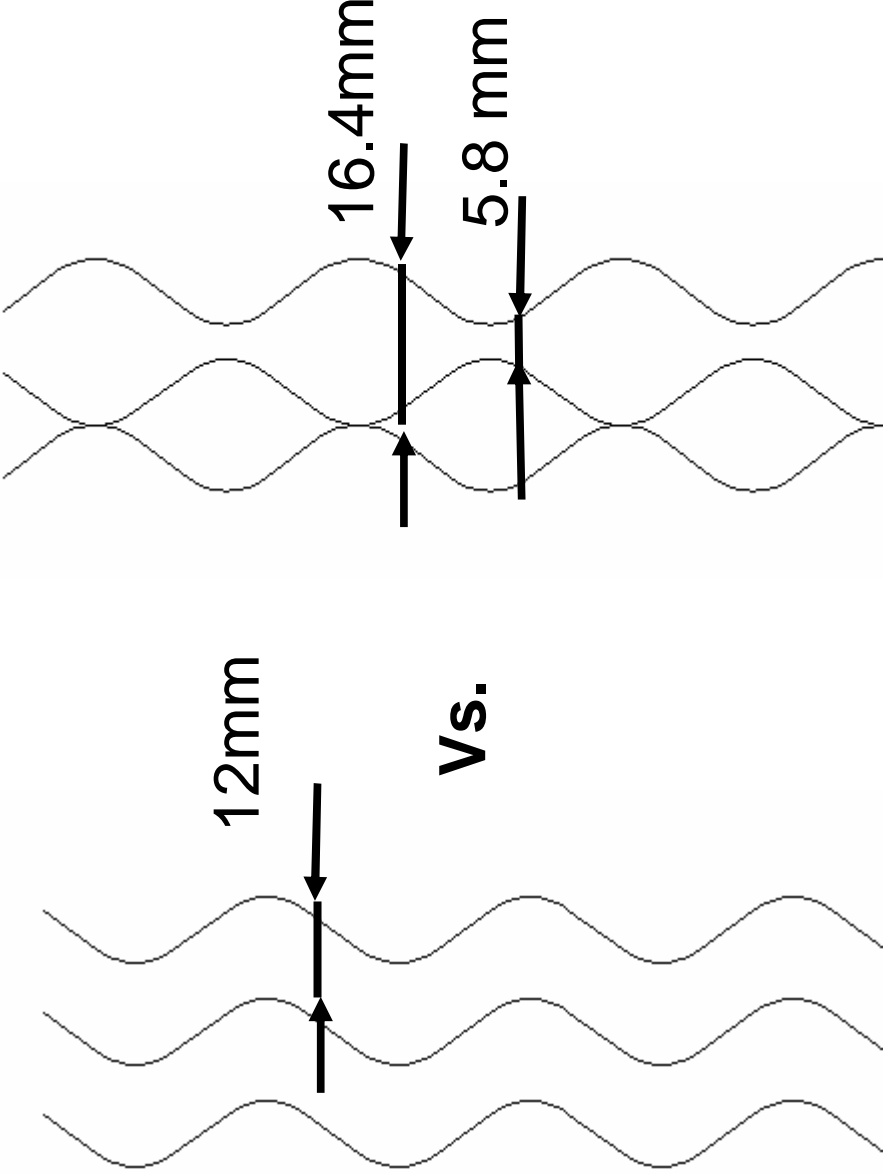
ONLY 20 Line Contact
Pts./ Sq.Ft.

Competitor's



Free-Flow Wide Gap Plate Heat Exchangers

- Uniform Width “Wide Gap” Designs



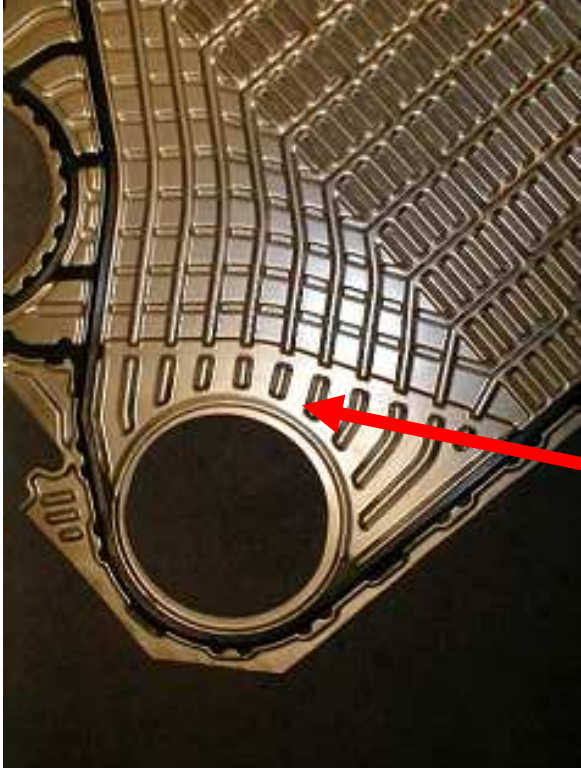
ITT Free-Flow Competitor’s “5/8 in. Gap”



Free-Flow Wide Gap Plate Heat Exchangers

- “Wide Gap” Designs

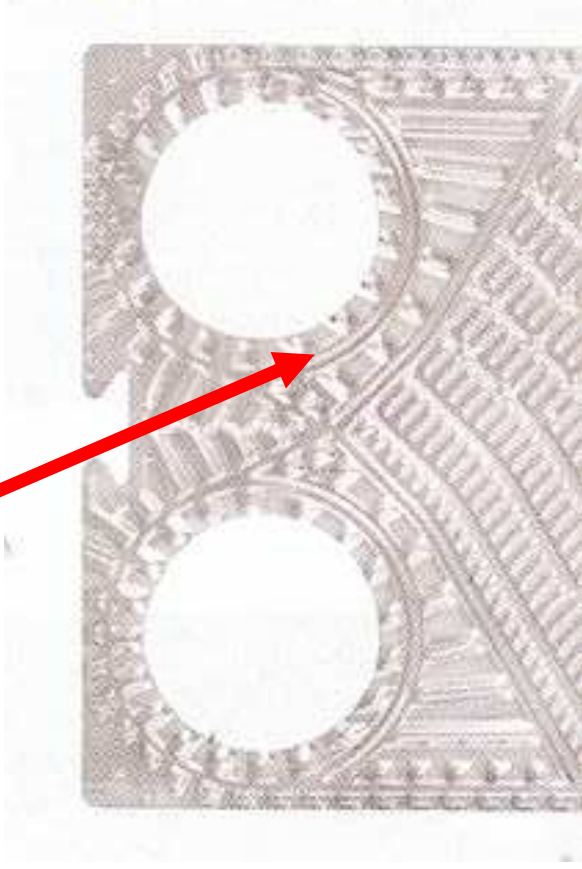
ITT Free-Flow



Smooth Port Inlet/Neck Surfaces Minimizes “clogging” .

Vs.

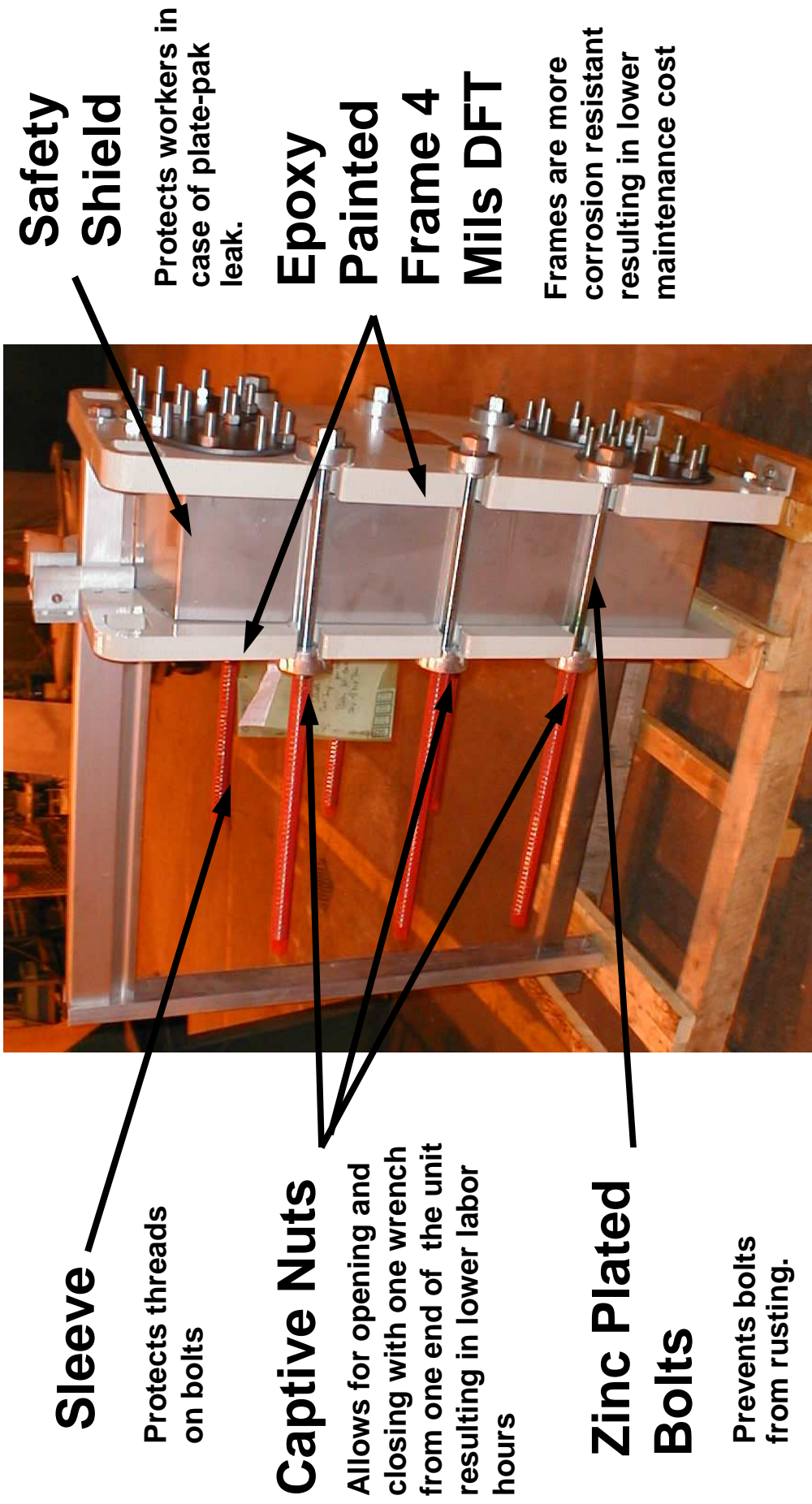
Sharp Port Inlet/Neck Surfaces Promote “clogging” .



Competitor



Gasketed Plate Exchanger, Assembly Features



Sleeve

Protects threads on bolts

Captive Nuts

Allows for opening and closing with one wrench from one end of the unit resulting in lower labor hours

Zinc Plated Bolts

Prevents bolts from rusting.

Safety Shield

Protects workers in case of plate-pak leak.

Epoxy Painted Frame 4 Mils DFT

Frames are more corrosion resistant resulting in lower maintenance cost



Plate Heat Exchanger Features & Benefits

- **Highly Efficient**
- **Compact**
- **True Counter-Current Flow**
- **High Velocity**
- **Expandable**
- **Easy Access / Clean**
- **Able to Assemble / Disassemble On-Site**

