Expone Star Thermal Engineering

Block Welded Plate Heat Exchanger Corrosive • Flammable • Phase Change • Compact

Industries Using Block HX

Oil & Gas Production - *Heat & Vapor Recovery, Heating, Cooling, Condensing, or Re-boiling in:* TEG Systems Gas Dehydration, Amine Sweet & Sour Gas, Crude Oil Dehydration and Desalination Systems, NGL Fractionation Systems, Refineries *(atmospheric and vacuum distillation)*, FCC, Hydrocracking, H₂S Strippers *(fractionators),* Propane & Butane Overhead Condensing in NGL and Alkylation Plants, Gasoline, Kerosene, Diesel, Bitumen, VGO *(vacuum gas oil),* Desalted Water/Feed Water Heat Recovery

Hydrocarbon Processing (HPI) - Heat & Vapor Recovery, Heating,

Cooling, Condensing, or Re-boiling in production of: **Primaries:** Olefins, Aromatics, Aldehydes, Acids, Ethers, Esters, Ketones, and Halogens; **Intermediates:** Acrolein, Acrylic acid and Acrylates, Acrylonitrile, Adipic Acid, Alkylbenzenes, Aniline/Nitrobenzene, Benzenesulphonic Acid, Bispenol A, Caprolactam, Diiso-Cyanates *(MDI & TDI)*, Ethylben-Zene/styrene, Ethylene Oxide/Glycol, Hexamethylenediamine *(HMDA)*, Maleic Anhydride, Melamine, Phenol, Phosgene, Phthalic Anhydride,Ppropylene Oxide/Glycol, Terephthalic Acid *(PTA)*/Dimethyl Terephthalate (DMT), Vinyl Acetate, Vinyl chloride, EDC

<u>Coke Oven Plants</u> - Ammonia Liquor Scrubber Cooling, Debenzolized Oil Cooling, Benzolized Oil Heating

Pharmaceutical & Chemicals - *Gas Cooling (drying) of:* CO2, Nitrogen, Chlorine, Nitric Acid, & Hydrogen, Fertilizer Production; Ammonia Heat Recovery and Stripping Column Reboiler, Hydrogene Heat Recovery and Cooling, Spent Sulphuric Acid Heat Recovery, Oleum Cooling, Polymers: Polyethylene, Polypropylene, Polystyrene and Styrene Co-Polymers, Formaldehyde Resins, Polycarbonates, Polyols, Polyvinyl Acetate, and Polyvinyl Alcohol other Organic Chemicals: Soaps and Detergents, Paintings and Coatings

<u>HVAC</u> - District Heating, Energy, Utilities, Hot Water Production, Steam Heating, Heat recovery

Process Challenge

Some aggressive processes (*i.e. corrosive/flammable*) require high thermal efficiency at extreme temperatures and/or pressures, in a fraction of the space.





Cross Section Area

Condenser, Evaporator, or Boiler, the Block's versatility derives from "chevron" type plates that introduce turbulence, are configured to eliminate cross temperatures and welded to form channels.

Compact thermal performance is achieved by proper spacing of plates coupled with flexible nozzle sizes to enable variable counter current flow rates. Fabrication is GTAW or laser welded.

Features Fully Welded Block Plate HX

- GTAW or Laser Welded SS Steel or Exotic Material
- Pressure Design Up to 465 PSIG
- Temperature Design up to 600 °F
- Variable Plate Spacing for Phase Change
- Counter Current Flow
- Approaching Temperature: 5.5 °F
- Flexible Mechanical Design for Nozzle Orientations
- Thermal Capacity: 6,450 ft.² Plate Area Per Unit
- Thermal Efficient Compact Size with Small Footprint
- Vertical or Horizontal Orientation
- ASME Sect. VIII PV "U" Stamp



Crude Oil Processing (3,444 sq.ft. - 254SMO)

Fully Welded Block Heat Exchanger



Exploded View

Orientation Can Be Designed to be Horizontal (as shown) or Vertical to Reduce Footprint

* Mechanical Specifications	Block	
Max Temperature:	600 ° F	320 ° C
Min Temperature:	-4 °F	-20 ° C
Approach Temperature:	5.5 °F	3 ° C
Max Pressure:	465 psi	3.21 MPa
Allowable Pressure Differential:	240 psi	1.65 MPa
Allowable Pressure Drop:	30 psi	0.21 MPa
Max Gap Distance:	0.22 in	6 mm
Plate Thickness:	0.08 in	2 mm
Max Channel Velocity:	6.50 ft./s	2 m/s
Max Surface Area Per Unit:	6,450 ft. ²	600 m ²
Avg. Heat Transfer Coefficient:	1,056 Btu/hr. ft.² ° F	6,000 W/m.²°C
Available Materials:	ASME Sect. VIII "U" Stamp • 304 • 316L • Ni-Alloy • Titanium	
Orientation:	Vertical • Horizontal	
Typical Fluid Applications:	Corrosive • Flammable	
Benefits:	Multiple Inlet/Outlet Nozzle Configurations	
Typical Application:	Cooling • Heating • Condenser • Evaporator	
Cleanability:	Process Fluid Side • Clean Fluid Side • CIP	
* Note:	Subject to Material, Application, and Fluid	



10690 Shadow Wood Dr. Suite 106 • Houston, TX 77043 +1.713.467.6122 • LSHeatTransfer.com