



Hybrid - Welded Heat Exchanger

with multi-flexible configuration for robust and efficient heat transfer



SPX®

Choosing the right Heat Exchanger can be a complex matter

How can one single heat exchanger technology cover all your key priorities?

- In a complex decision process, neglecting key priorities may lead to low performance or even plant failure – things you would re-do if you could.
- With more than a century of heat exchanger experience, SPX knows the needs and priorities of most industries.
- Let SPX guide you through complex choices to the right solution for your specific application and needs.

If these are some of your priorities...

	WHAT COULD HAPPEN IF YOU COMPROMISE HERE?	WHAT CAN YOU EXPECT FROM SPX AND HYBRID?
Very high working temperature, (including temperature shocks)	Equipment failure/ replacement	Longer production runtime
Very high working pressure (including pressure shocks)	Equipment failure/ replacement	Longer production runtime
Small footprint	High conversion/ engineering costs	Cost savings, accessibility
High heat recovery, extreme small log mean temperature difference	Higher running costs	Cost savings, lower CO ₂ footprint
Cleanability, manual and CIP	Reduced efficiency	Operation at desired specification after cleaning
Resistance to corrosion	Equipment failure/ replacement	Long service life

... Hybrid is for you!

Based on a multi-flexible configuration platform, Hybrid is designed to operate under harsh conditions where other heat exchanger technologies can fail, have a shorter operating lifetime, or reduce operational efficiency.

What's more, easy access makes high-pressure cleaning of Hybrid plates simple, effective and fast!

Typical Industries Served

- Chemical
- Petrochemical
- Refinery
- Oil and Gas
- Gas Sweetening Process
- Metals and Mining
- Edible Oils
- Power

Feature:

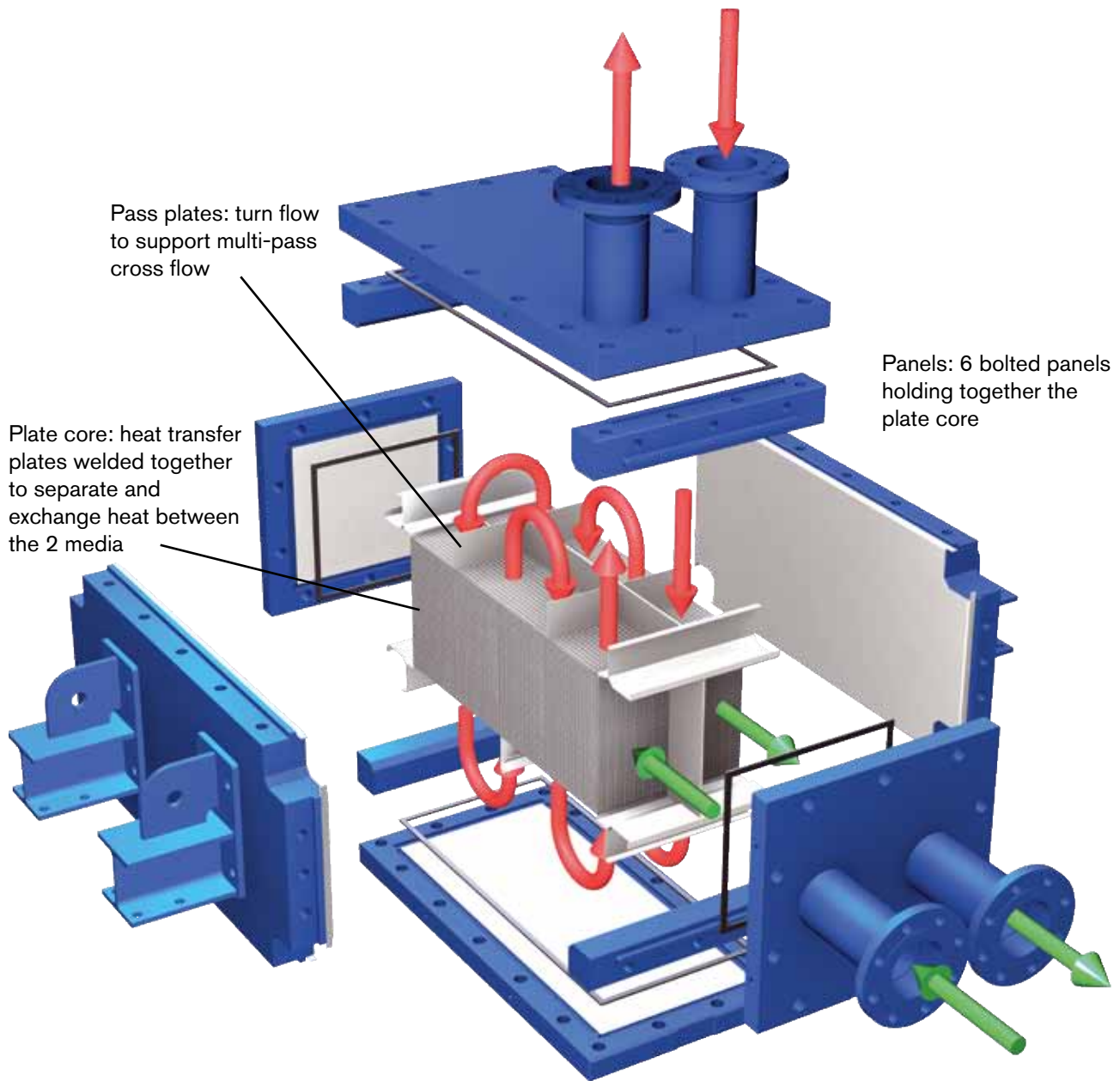
- ✓ Design pressure up to 580 psig (40 bar)
- ✓ Design temperature up to 662°F (350°C)
- ✓ Corrosive media
- ✓ For liquid, gas, steam and air with low pressure drop
- ✓ For pass-through of fluids with particles and solids

Common Application Include:

- Liquid and/or Gas Heater
- Liquid and/or Gas Coolers
- Crude Oil Heaters
- Steam Heating
- Process and/or Gas Condensers
- Heat Recovery for Gas Dehydration
- Heat Recover, Cooling, Condensing and Reboiling for Gas Sweetening
- Reboilers
- Solvent Extraction
- Spent Sulfuric Acid Heat Recovery
- Heat Recovery for Edible Oil Deodorization

The heart of the matter

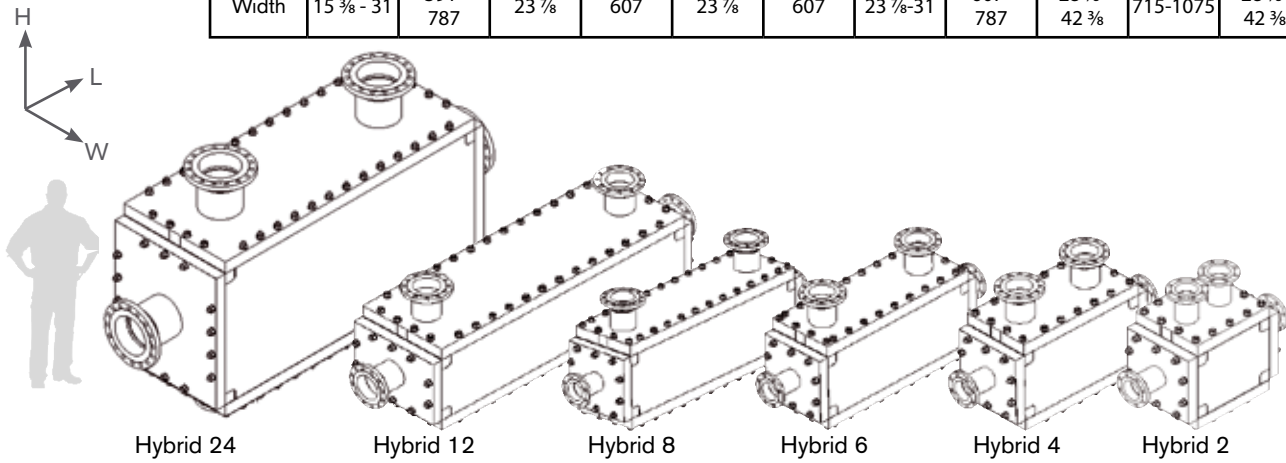
The central plate core is contained by 4 movable pressure panels, and the 2 flows are separated by the plate wall and 4 corner bars.



Unseen flexibility based on a range of standard variants...

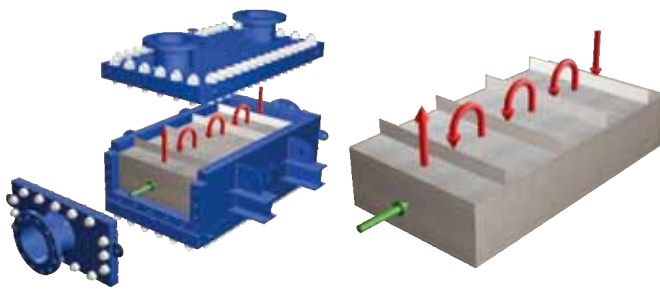
6 basic models

Models	2		4		6		8		12		24	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
Height	41 3/8	1052	41 3/8	1052	41 3/8	1052	41 3/8	1052	41 3/8	1052	58 3/8	1484
Length	56 1/8	1425	73 1/8	1857	90 1/8	2289	107 1/8	2721	141 1/8	3585	141 1/8	3585
Width	15 3/8 - 31	391-787	23 3/8	607	23 3/8	607	23 3/8-31	607-787	28 1/8-42 3/8	715-1075	28 1/8-42 3/8	715-1075



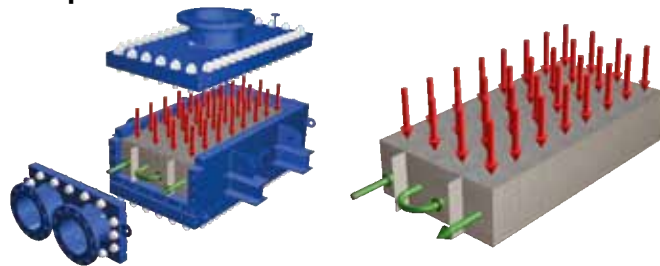
Each available in various standard configurations:

Example 1



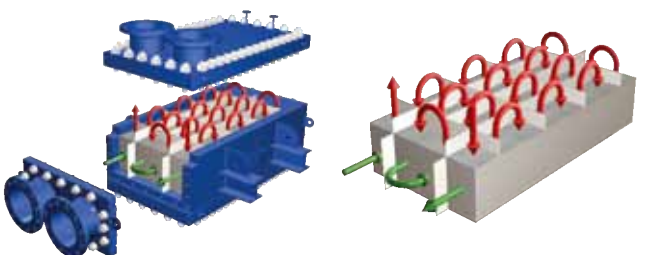
Low number of passes tube side system in combination with single pass corrugated side system for low NTU value applications and/or low pressure drop requirements

Example 2



Single pass tube system in combination with corrugated side sandwich system for multiphase applications (e.g. condensation)

Example 3



High number of passes tube side system in combination with corrugated side sandwich system for close temperature approach applications (heat recovery)

Flexibility and the high number of variants eliminate

... to meet all your needs

- We will always find the perfect solution
- Perfect adaptability for almost any application
- Full utilisation of pressure drop to maximise thermal efficiency
- Close temperature approach down to 1.8°F (1°C) possible
- Low pressure drop possible – even at high mass flows – even for gas/steam
- Perfect for condensation and evaporation (including vacuum condensation)
- Large connection sizes possible
- Non-symmetric flows handled, even with perfect pressure drop utilisation

456 standard Combinations per plate material:

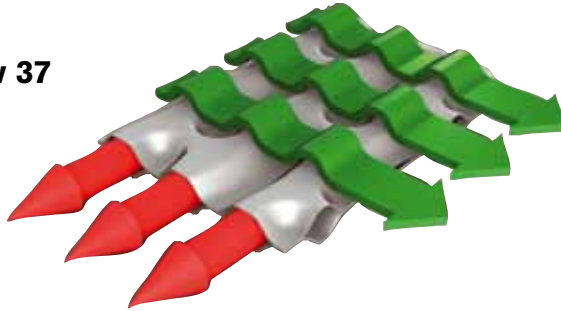
MODEL	2	4	6	8	12	24
Number of thermal steps	2	4	6	8	12	2x12
Stack height versions	5	1	1	3	5	5
Possible pass combinations on primary side (corrugated side)	3	3	3	3	3	3
Possible pass combinations on secondary side (tubular side)	4	5	7	6	9	9

- Design Pressure: 232.1 or 464.1 psig (16 or 32 Bar)
- Design Code: ASME VIII, Div 1 or PED
- Design Temperature: -18.4/-40 to 662°F
-28/-40 to 350°C

3 plate variants – depending on your needs

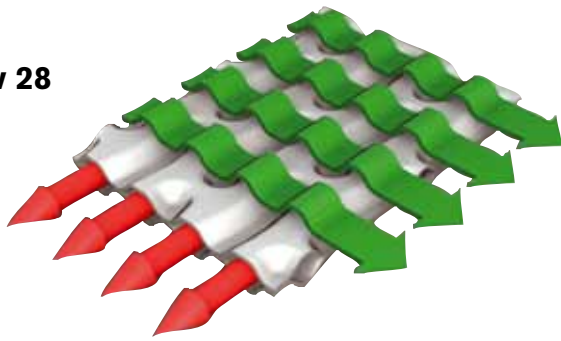
Hybrid features 3 very different plate types!

TuplaFlow 37



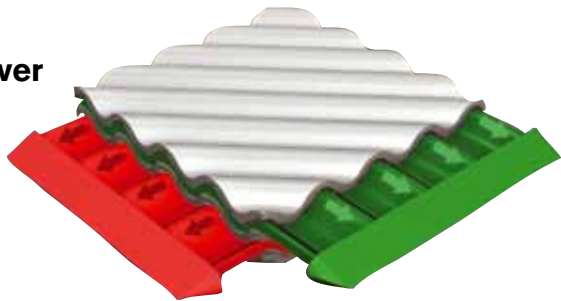
- If manual cleaning and/or low pressure drop are essential (e.g. steam/gas).
- Pressure drop on tube side can be kept extremely low
- Excellent for gas/steam
- Excellent mechanical cleanability combined with high heat transfer performance

TuplaFlow 28

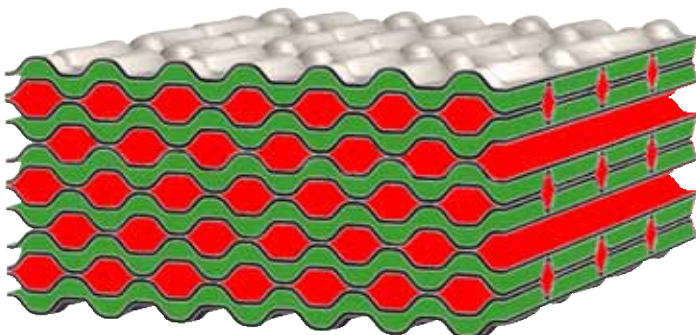


- If you want the best combination in between.
- Good mechanical cleanability combined with excellent heat transfer performance

EnergySaver



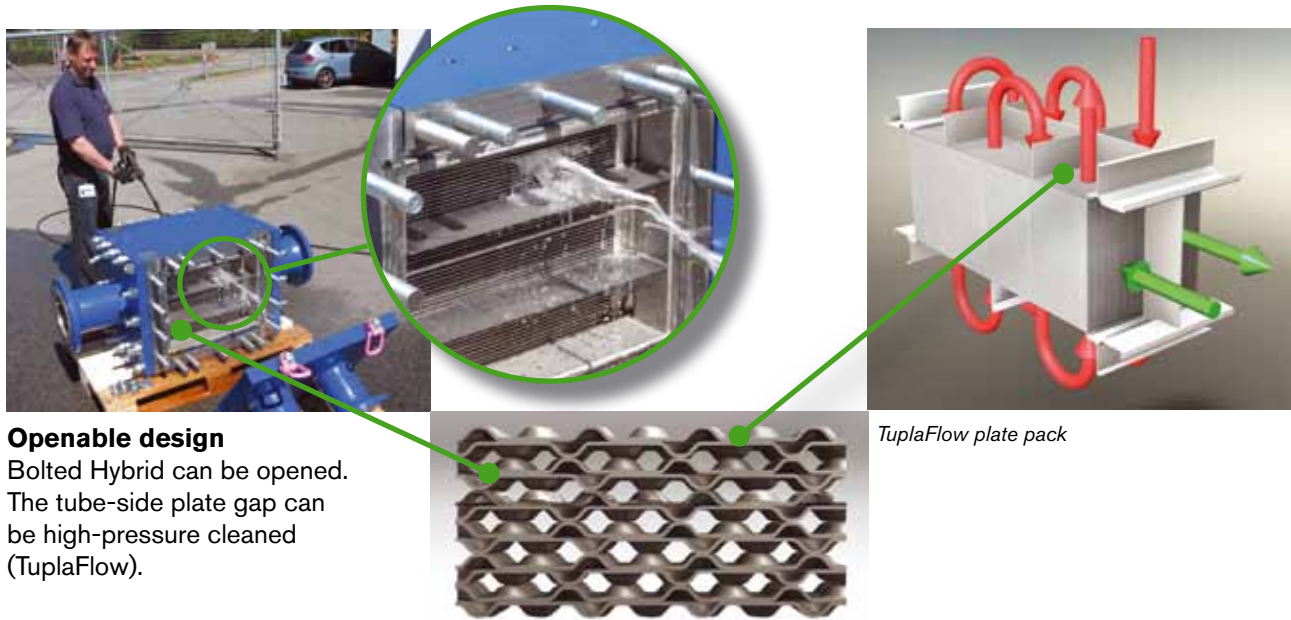
- If your focus is optimum efficiency and pressure drop limitations are not an issue.
- High turbulence
- Highest efficiency
- Highest pressure resistance



- Cross section of TuplaFlow plate types
- All plates are cross-flow

Do fouling or scaling impact your production planning?

- Spare capacity, filter systems or CIP cleaning systems are expensive to install.
- 2 of the 3 plate options can be cleaned effectively using manual high pressure cleaning.



Huge flexibility based on standard variants

MODEL		2	4	6	8	12	24
Heat transfer	ft ²	64.6-269.1	301.4-355.2	441.3-538.2	592.1-1044.1	1130.2-2346.5	2260.4-4693.1
	m ²	6-25	28-33	41-50	55-97	105-218	210-436
Max. nozzle size Tubu side		18"	14"	14"	20"	20"	20"
Max. nozzle size Corrugated side		12"	12"	12"	12"	12"	20"
Material plates		Standard: 316L Stainless Steel On request: 304 Stainless Steel, Alloy 904, Alloy 254 SMO, Alloy 276, Alloy C22, Alloy C2000 and others.					
Design temperature		According to ASME VIII: -18.4°F to 662°F (-28°C to 350°C) According to PED 97/23 EG: -40°F to 662°F (-40°C to 350°C)					
Design pressure		232 and 464 psig (16 and 32 bar) versions, including full vacuum.					
Design code		PED 97/23 EG / EN 13445 ASME. VIII, Div. 1					
Flange ratings		Welded neck flanges ANSI B16.5					
Nozzle loads		API 662 Table II					

Customization Options:

- Plates in other alloys
- Fully welded vessel construction (not openable)
- Venting options
- Sub cooling
- >53,820 ft² (5,000 m²) heat transfer area





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