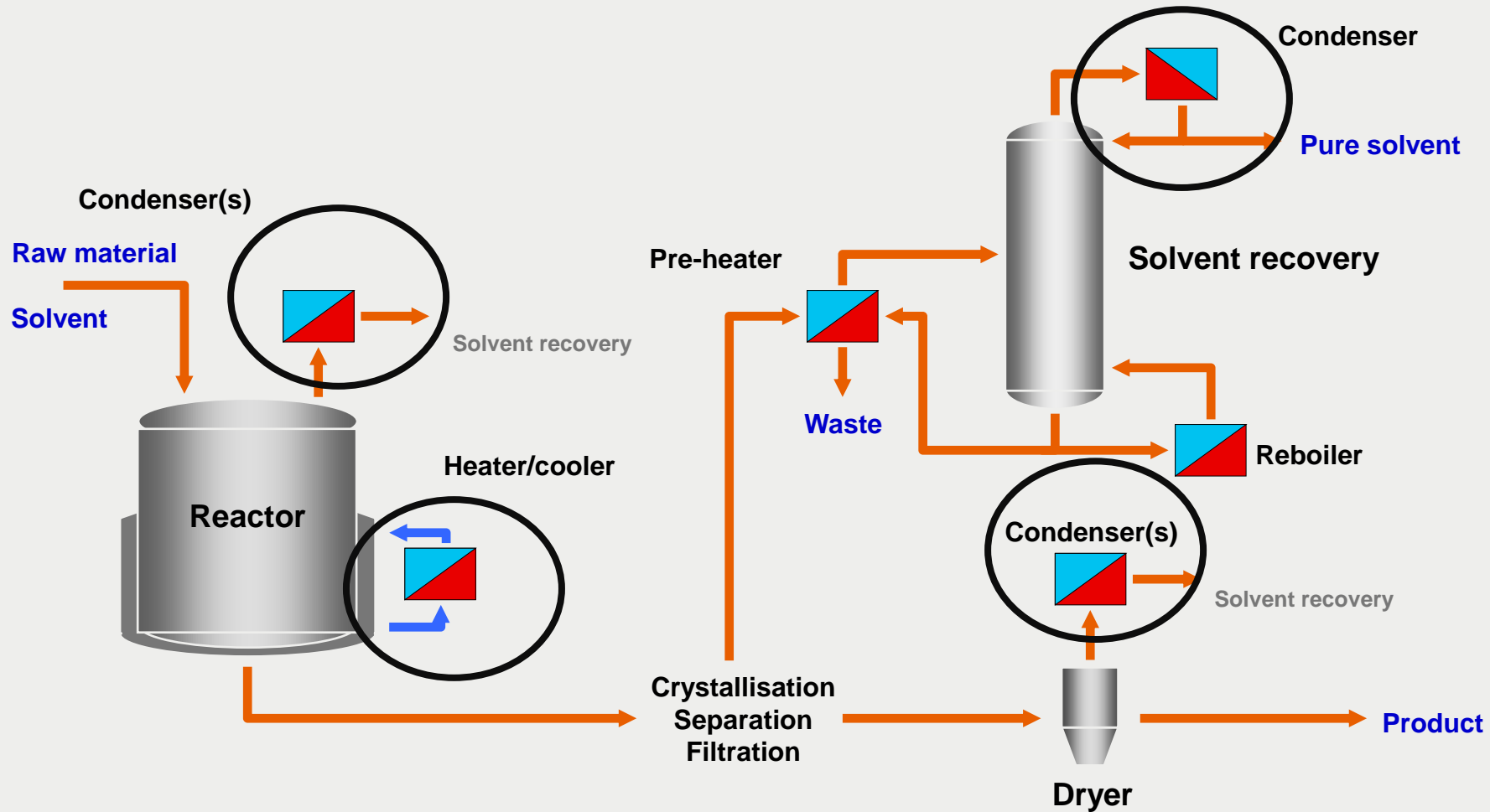


Alfa Laval

Advanced and Compact Hygienic Condensers for your API needs

Positions for Condensers in API

Condensers, Reboilers and Sub-coolers



Condensers for APIs

Solvent recovery, Tank farm, Sub-coolers



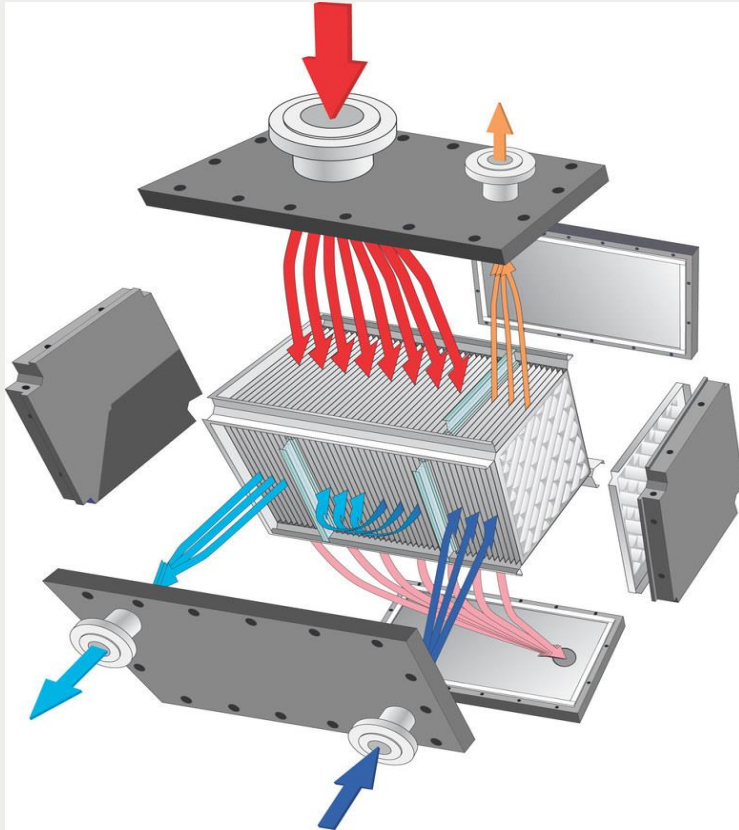
**Compabloc condenser for Hastelloy,
Glass-lined reactors**



**Spiral condensers for Stainless
steel reactors**

2-Pass Compabloc Condensers

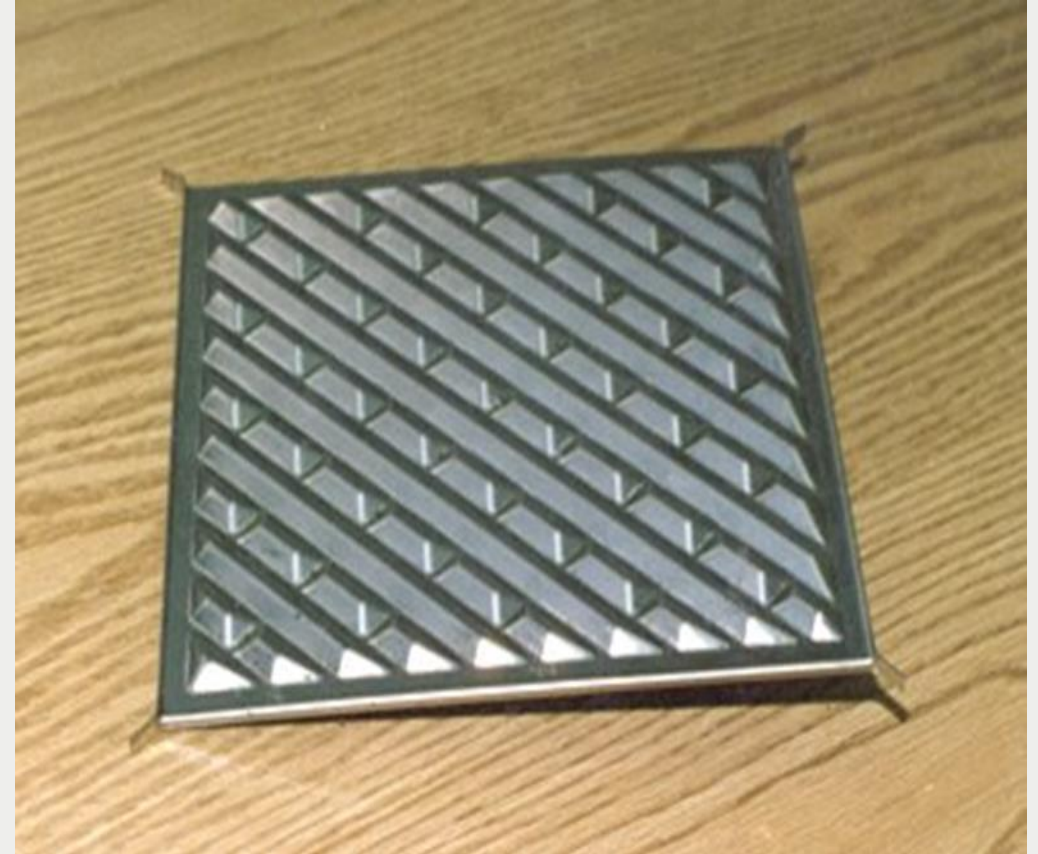
Heat transfer plate material: Hastelloy C-22

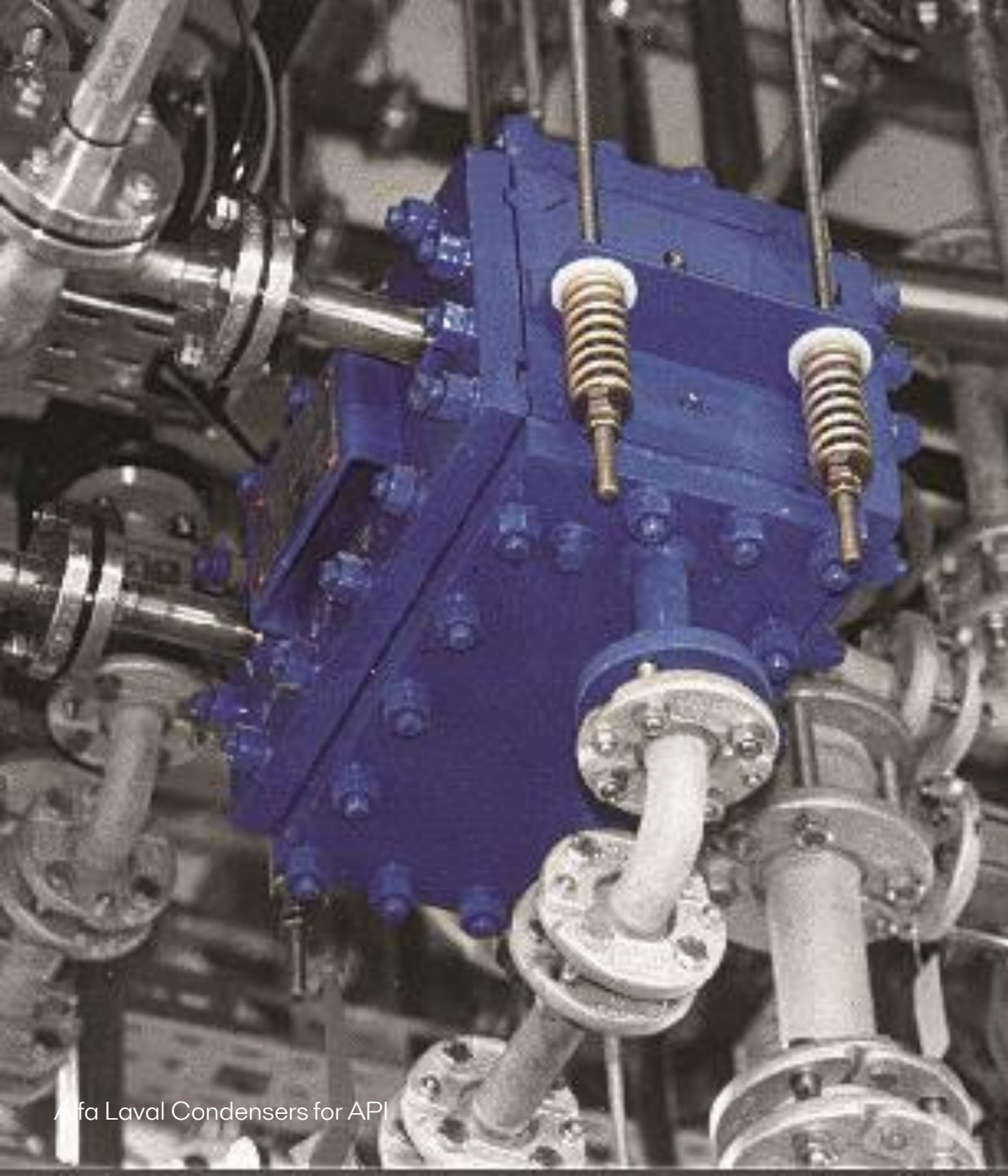


Heat transfer plate of Compabloc

Heat transfer plate material: Hastelloy C-22

- Cleanable
- Fully robotic laser and TIG welding
- Thickness: 0.8-1 mm
- Effective channel gap: 5 mm





Design criteria for Compabloc ⁶

- Design temperature: -40°C to 200°C
- Design pressures: Full vacuum to 16 bar g
- Standard Material: AISI 316L, Hastelloy C-22,
- Other available materials (on request) are 304L, 310L, Ti-Pd, Titanium



Benefits - Compabloc⁷

The **heat transfer area required is 1/4th** compared to corrugated S&T/ Graphite bloc

U values in the range of **1200-2500 kcal/(m²·h·°C)**

Completely drainable

More than **98% Solvent recovery in Primary**

Condenser

Very Close temperature approach possible.



Benefits- Compabloc⁸

- Venting of non-condensable is effective
- **Subcooling possible**
- Compact in size ; Require less area and installation cost
- Completely **gasket free in Heat Transfer Area**
- Both side **possible to clean mechanically/ CIP able**
- **Less solvent for Cleaning (Compact)**
- **Easy Cleaning Validation (No Crevices)**

End Customer	No. Of Units
Cipla Ltd.	1
Granules	19
Unichem	43
Acebright	11
Zydus Cadila	1
Divi's Laboratories	1
Optimus Pharma	2
Sun Pharma Ltd.	2
Mankind Pharma	3
Alembic Pharm	10
Aarti Drugs	2
Anthem Bio	22
Aragen Pharma	8
Dhanuka	2
IPCA Laboratories	1
Neoanthem	19
Cadila Pharma	10
	157

Customer-base for Compabloc

- Eliminated the need of secondary Condenser
- Sub-cooling of the condensate within the condenser itself. Possible to eliminate Sub-Cooler
- **More than 3000 installed units globally**



SATISFIED CUSTOMERS !

Compabloc Condenser for Distillation Column

Heat Recovery. District Heating. Water saving

<3
months

Payback
period

1800
tonnes

Annual
CO₂ reduction

No financial risk:

Speedy payback through drastic heat recovery.

No operational risk:

Robust solution. Minimum maintenance.

No product quality risk:

Solvent recovered is pure and re-used.

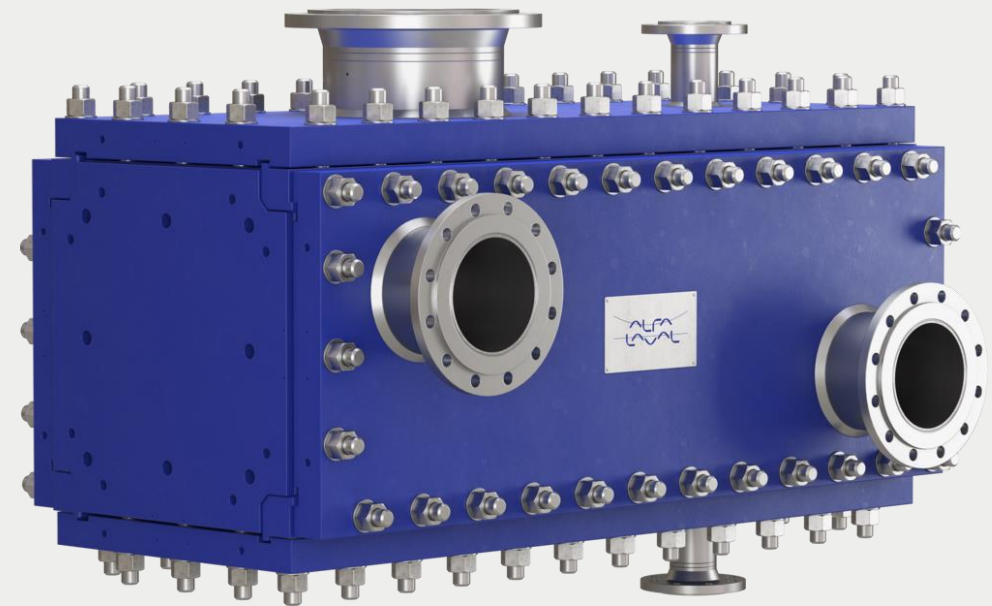
180,000
m³

Water/CIP media
saved every year

4,000,000
kWh

Saved
annually

With maintained mechanical and biological cleaning efficiency.



Results are based on users' provided data for actual costs of energy.

Compabloc Interchanger for Sterilization System

Heat Recovery. Water saving

<2
months

Payback
period

7600
tonnes

Annual
CO₂ reduction

670,000
m³

Water/CIP media
saved every year

16,000,000
kWh

Saved
annually

With maintained mechanical and
biological cleaning efficiency.

No financial risk:

Speedy payback through
drastic heat recovery.

No operational risk:

Robust solution. Minimum
maintenance.

No product quality risk:

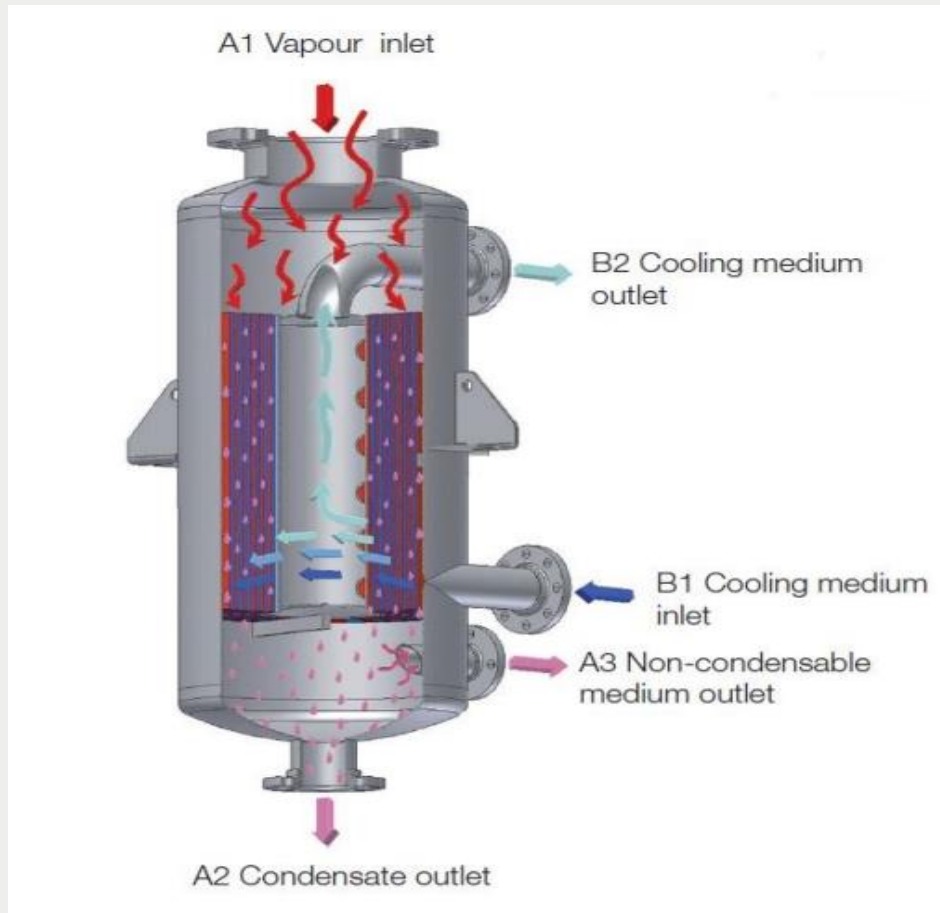
Drainable. Easy to clean.
Less degraded compounds.



Results are based on users' provided data for actual costs of energy.

Spiral Condensers

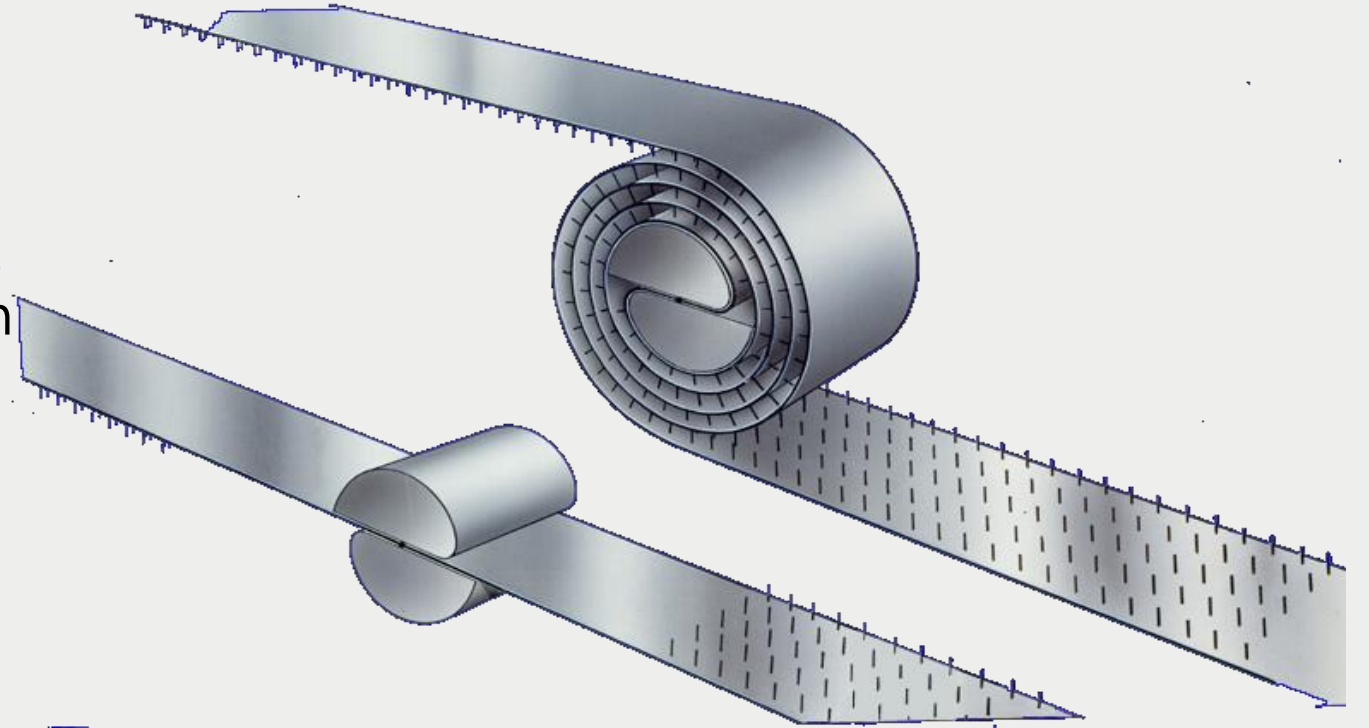
Heat transfer plate material: Alloy 316L



Heat transfer plate of SHE

Heat transfer plate material: Alloy 316L

- Automatic spot-welded studs
- Plate Thickness: min. 2 mm
- Effective channel gap: 6-12 mm





Design criteria for SHE ¹⁴

- Design temperature: -100°C to 200°C
- Design pressures: Full vacuum to 9 bar g
- Standard Material: AISI 316L

Benefits - Spirals



- The **heat transfer area** required **30-50% less** compared to S&T
- U values in the range of **800-1800 kcal/(m²·h·°C)**
- **Completely drainable** on vapour side
- More than 98% Solvent recovery in Primary condenser
- **Close temperature** approach possible.
- Venting of non-condensable is effective
- Compact in size ; Require less area and installation cost
- Completely **gasket free**
- Vapour side is **100% visually inspectable.**
- Less solvent for Cleaning (Compact)
- Easy Cleaning Validation (No Crevices)

Our Proud Customers for Spiral



Alfa Laval Thermal Product Portfolio

GPHE

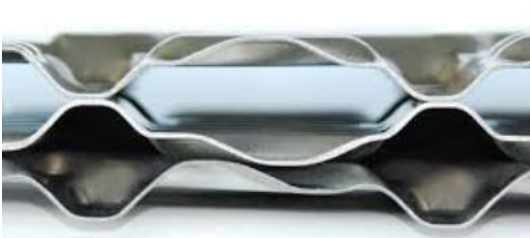


Plate Condenser



Plate Evaporator



Viscoline



VLA



Contherm (SSE)

BRAZED HEAT EXCHANGERS



POU



Double Tube Sheet

THANK YOU

