

SPIRAL TUBE HEAT EXCHANGER

Energy efficiency as key element towards a low-carbon future

Refining, petrochemical, gas, pharmaceutical, and power industries need energy efficiency solutions to reduce their ecological footprint.

Nectis combines the expertise in heat exchange design & manufacturing of Zhenhai Petrochemical Jianan Engineering Co. Ltd (ZPJE) with its Spiral Tube Heat Exchangers (STHE) and AXENS historical experience in process and operations.

It offers an innovative solution to unlock heat integration opportunities and optimize the project's environmental impact and economics.

Spiral Tube Heat Exchangers have been used in the cryogenic liquefaction industry since the beginning of the 20th century. For more than 30 years, ZPJE has developed this technology to be successfully implemented in high-pressure, high-temperature, and fouling processes such as Hydrocracking, Middle Distillates, Naphtha Hydrotreatment, Catalytic Reforming, Aromatics Complexes, Atmospheric Distillation, Ethylene units etc...



KEY FIGURES

Spiral Tube Heat Exchangers (STHE) helps to unlock heat integration opportunities in demanding process services.

Nectis provides the full scope of services required for the integration of the STHE to the process scheme: studies, installation supervision, commissioning and follow-up. With its high expertise, Nectis helps industries to lower their carbon footprint.



30 000 m²
IN A SINGLE EQUIPMENT



FIRST REFERENCE IN OPERATION FOR
20 YEARS



MORE THAN
1,700 REFERENCES



180 PATENTS

BENEFITS

- High heat transfer efficiency
- Low pressure drop
- High reliability
- Opex Reduction
- No limitation in processed cracked feedstock thanks to self-cleaning capability
- Plot area saving
- Easy cleaning & maintenance

DESIGN

The design of spiral tube heat exchangers consist of many tubes arranged in multiple layers of helical coils, around a center pipe. This tube bundle is enclosed in a cylindrical pressure vessel. The fluid on the tube side and on the shell side flows in opposite directions, making the equipment a true countercurrent heat exchanger.

FABRICATION

TUBES MATERIALS:

• Materials: CS, Cr-Mo (1Cr-0.5Mo, 1.25Cr-0.5Mo, 2.25Cr-1Mo), SS (304, 304L, 304H, 316, 316L, 321, 321H), super SS (SMO254), Duplex SS (2205), Titanium, High Nickel Alloy (Incoloy 825, Inconel 600, Inconel 625).

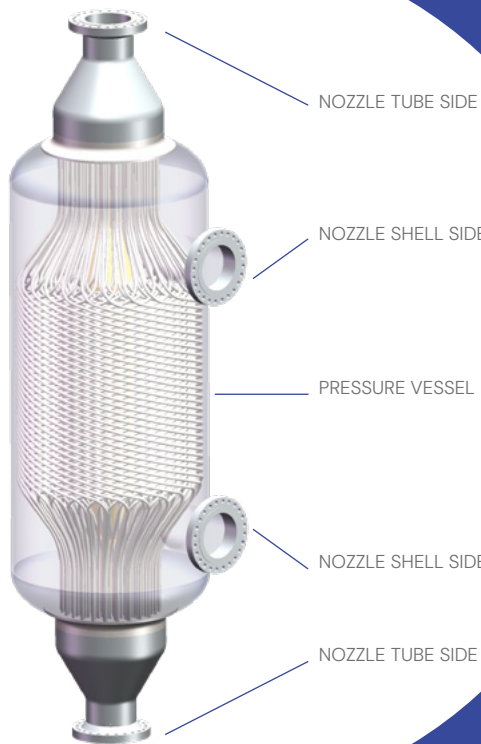
SHELL MATERIAL:

CS, Cr-Mo(1Cr-0.5Mo, 1.25Cr-0.5Mo, 2.25Cr-1Mo), SS(304, 304L, 304H, 316, 316L, 321, 321H), Titanium.

Pressure vessel diameter: up to 6,000 mm,
Weight: over 700 metric tons.

CERTIFICATIONS:

- PED 4.3 qualified by E.U.
- ASME authorization certificates of U & U2.
- ISO 9001 / ISO 14001 / ISO 45001



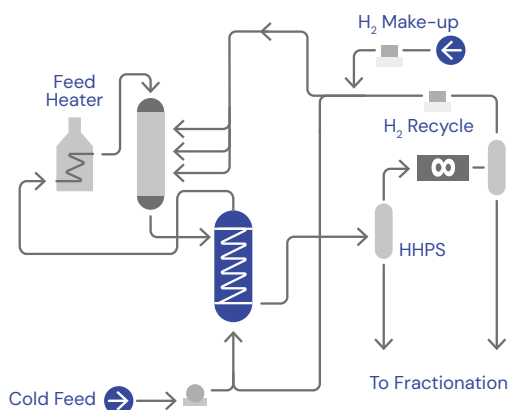
CASE STUDY #1

Grassroot DHDT

One single STHE was chosen to replace 2 trains of multiple standards S&T exchangers on a large capacity unit.

RESULTS: Lower CAPEX & OPEX & Lower CO₂ Emissions

BENEFITS		
CAPEX	✓ FEED / EFFLUENT EXCHANGERS	-50%
	✓ FEED HEATER	-15%
	✓ RECYCLE GAS COMPRESSOR	-5%
OPEX	✓ HEATER'S DUTY	-28%
	✓ COMPRESSORS / FEED PUMPS	-12%
➔ 15,000 t CO₂ PER YEAR SAVED		



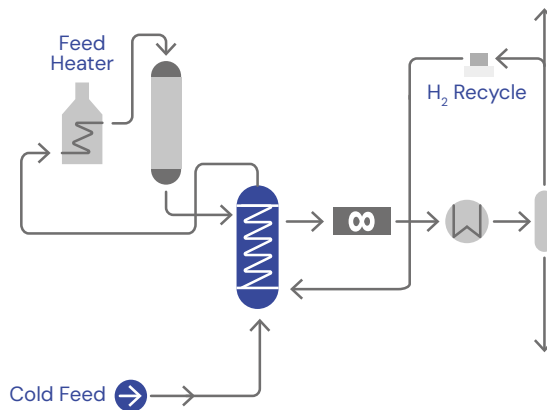
CASE STUDY #2

CCR Revamping

High efficiency STHE was chosen to replace a poor performing old texas tower S&T exchanger.

RESULTS: 25% of Fuel Gas consumption savings

BENEFITS	BEFORE	AFTER
✓ FEED RATE (TPD)	1685	1700
✓ TOTAL FUEL GAS (MTPD)	65.37	50.13
✓ HX OUTLET TEMP (°C)	362.7	452.2
✓ HOT APPROACH (°C)	106.8	27.6
➔ FUEL GAS COST SAVINGS PER YEAR = USD 2,250,000		



Discover more case studies:



www.nectis.net

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