



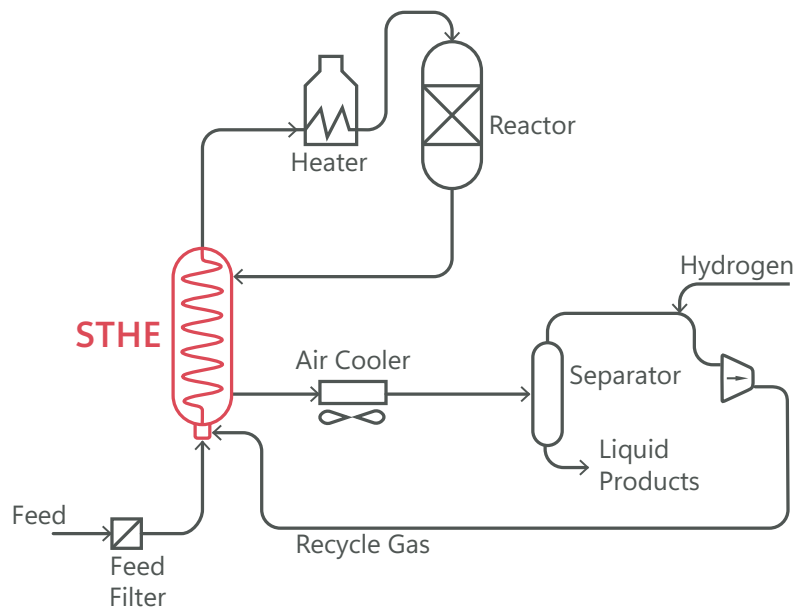
ZPJE

Creating Value for Our Customers

Zhenhai Petrochemical Jianan Engineering Co.,Ltd.
镇海石化建安工程股份有限公司

STHE TECHNOLOGY IN AROMATIC PRODUCTION

The purpose of an aromatic complex is to convert naphtha and pyrolysis gasoline into three intermediate chemical products : Benzene, Toluene and Xylenes (ortho and para), better known as BTX. The amounts of each aromatic produced may vary depending on current market demand, but typically, production of benzene is favored. BTX is essential for extracting and creating in-demand products such as benzene (one of the primary chemical building blocks for the petrochemical industry) and nylon . ZPJE proposes large, robust and efficient feed-effluent Spiral Tube Heat Exchangers (STHE) for the Reforming, the Xylene Isomerization and the Toluene Disproportionation processes.



STHE BENEFITS

STHE technology brings many advantages in Aromatic production :

Efficiency :

On the tube side, the Helix-pattern flow in the tubes creates a secondary flow consisting of a pair of vortices enhancing the heat transfer coefficient at the peripheral of the tubes. On the shell side, the pulse-surge collision flow regime brings high turbulence increasing the coefficient outside the tubes.

This allows for an achievable **hot approach temperature** of less than **30°C**.

Leakage :

High quality tubes fabrication and proprietary designed internals, severe welding procedures and state-of-the-art fabrication workshop make ZPJE exchangers strong, robust and **reliable**.

Fouling :

On the shell side, the high turbulence created by the pulse-surge collision flow pattern and the absence of stagnant zone greatly reduces the possibility of fouling. On the tube side, the helix-pattern flow creates a secondary flow which increases the shear force. This effect, added to the very low surface roughness, gives an **anti-fouling** and **self cleaning** design.

Robustness:

There are **no mechanical limitations** in temperature rise and fall, making STHE technology highly reliable under process condition fluctuation. It allows for very **low constraints** on start-up/shutdown procedures, and emergency situations.



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CASE STUDY

Example of a 100,000 bpsd Xylene Isomerization unit equipped with 2 texas tower exchangers :

	ZPJE	S/T
Number of exchanger	1	2
Hot Approach Temperature	30 °C	50 °C
Energy Saved	11.74 Gcal/h	
Operation Savings		
Fuel Savings (*)	4,400 k€/year	
Emission savings (**)	1,300 k€/year	
Total Savings	5,700 k€/year	

(*) Considering Fuel Gas @300€/ton. (**) Considering emission savings in Europe. May vary upon installation area.

ZPJE EXPERIENCE

STHE as Feed/Effluent in Aromatics :



42 references



13 years in Operation in Disproportionation unit



31 in Operation



>43,000 Days of cumulative operation



>135 MMTA total installed Capacity



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