

Reflux Condenser ()

(Process Intensification)

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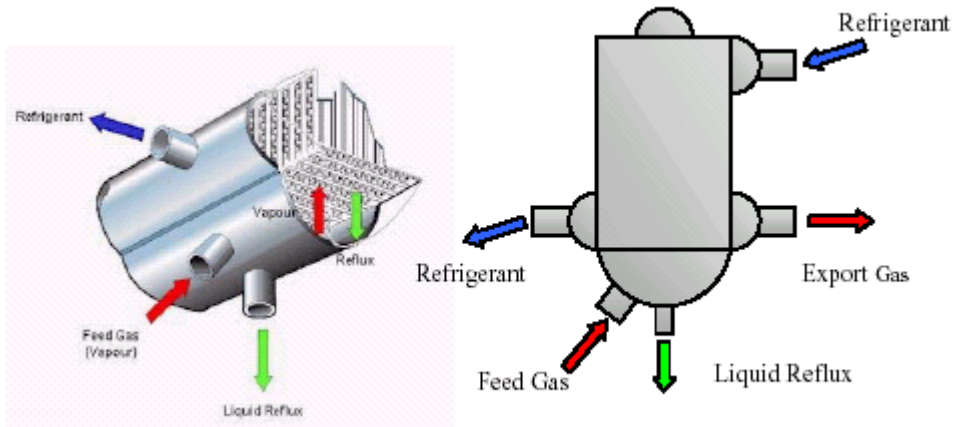
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Compact plate-fin

(PFHE)

Dephlegmators



1. Compact Plate-Fin Heat Exchanger

Ifpexol technology (2)

IFP 1986

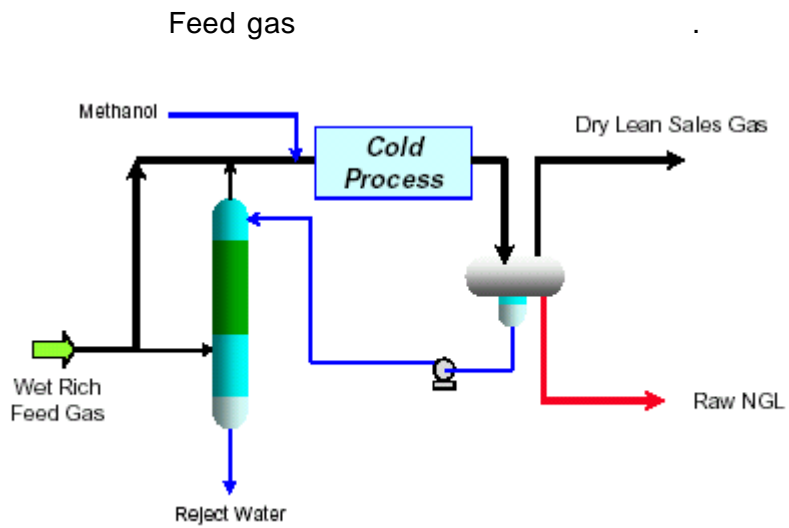
Natural Gas

2

90

cold process

stripping column



2. IFPEXOL Process

IFPEXOL Process

cold process

3

cold separator

Dephlegmator

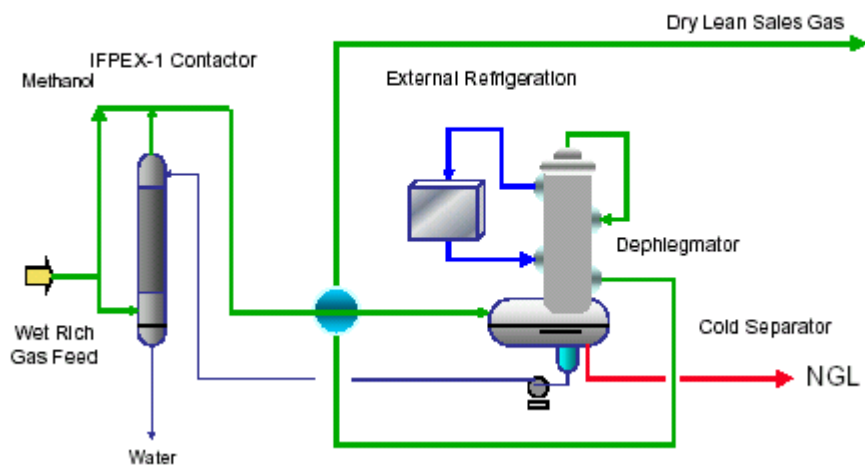
가 가

cold separator

IFPEX-1 contactor

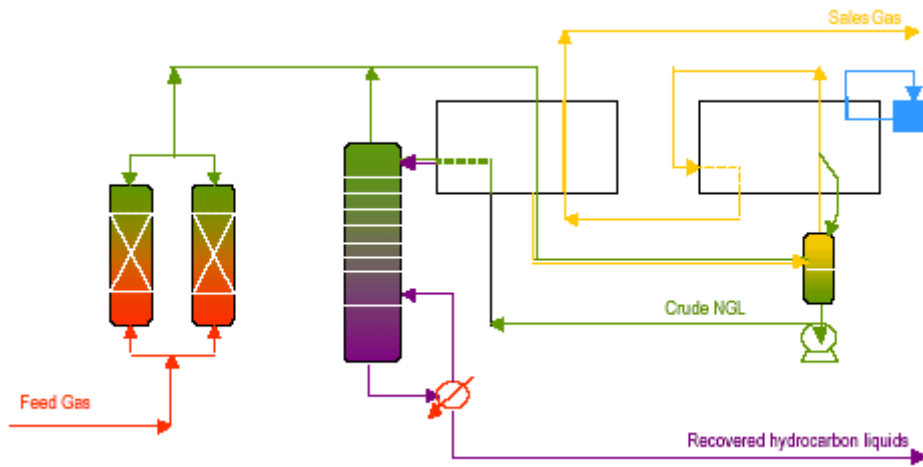
cold separator

NGL(Natural Gas Liquid)



3. Dephlexol Process

PFHE 4 Costain PETROFLUX



4. Costain PETROFLUX

PFHE 1

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. Dephlexol Process

VOC(volatile organic compounds)

CO2

1. surface to volume ratio

Exchanger Type	Typical Surface Area per unit volume sq.ft./cu.ft.
Shell-and-tube	15 - 25
Plate-and-frame	30 - 55
Spiral	20 - 30
Plate-fin	150 - 600
Printed Circuit	150 - 250

PFHE가 가 shell and tube

가

Shell and tube

가

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frictional drag

viscous shear

profile

0

radial

boundary layer

boundary layer

stagnant fluid

shear force

mixing

가

4

stagnant fluid

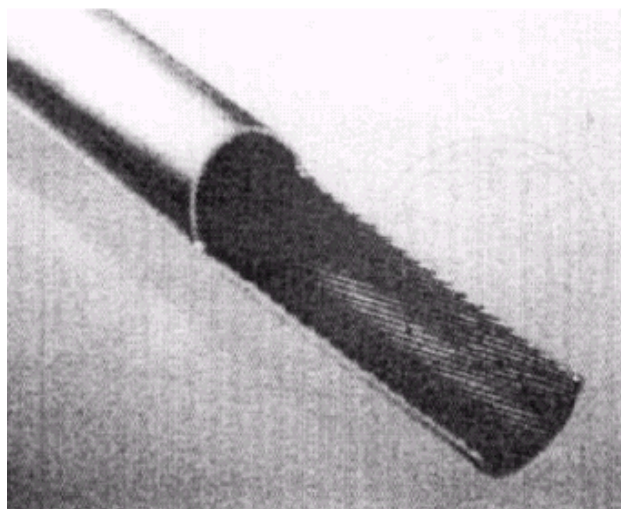
fin

,

helix

, pitch

Microfin tube가



4. Microfin tube

CalGavin

wire insert

5

twisted

wire가



5. HiTran[®] twisted wire insert

Helical microfin

wire insert

2

6

가

가

rippling,

turbulence,

local film thinning

fin effect

shell and

tube

fouling factor

가

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