Phoenix equipment corporation

Plant # 374

# C5/C6 Isomerization Plant for Sale

**Capacity**
The Dehexaniser column fractionates hydrotreatedd naphtha into a C5 /C6 overhead stream and a C7+ bottoms stream and has a design throughput of 366 $m^3$/h. The Penex unit isomerises the C5 /C6 stream and has a design throughput of 92 $m^3$/h of fresh feed plus 25$m^3$/h of recycle from the Molex unit. The Molex unit separates iso and normal molecules and has a design throughput of 120 $m^3$/h.

**Feedstock**
Hydrotreated naphtha

**Product**
High octane isomers

**Process Technology**
UOP

**Engineering Design**
Foster Wheeler

**Plant History**
1995 – Commissioned
2012 – Shut down

**Major Equipment**
Dehexaniser distillation column (71 trays)
Penex reactors (1st & 2nd)
Molecular sieve driers
Extract column
Product separator

**BRIEF PLANT DESCRIPTION**

The Isomerisation unit can be considered to be made up of three separate processing facilities, a Dehexaniser unit, an Isomerisation unit (Penex) and a Molecular Sieve separation unit (Molex). Its purpose is to take a C5 /C6 fraction out of pre-treated naphtha, supplied from the naphtha hydro-treaters, and process it in such a way that the resulting C5 /C6 product stream has the highest octane number achievable. Without the unit, the C5 material would be blended directly into finished gasoline and the C6 material fed to the CCR, where part of it would be converted to Benzene. The quantity of Benzene produced, when blended into finished product, would cause some grades of gasoline to be out of specifications. The C5 /C6 stream produced as an overhead liquid product from the Dehexaniser contains a mixture of iso and normal C5's and iso and normal C6's. Isomerisation involves converting the low octane normals to their higher octane isomers. This is accomplished by passing the feed over a fixed catalyst bed in the presence of hydrogen. The hydrogen is continuously recycled around the reactor circuit. Because it is an equilibrium reaction, 100% conversion of the normals is not achieved. The maximum octane of the product is obtained by separating the unconverted normals, using a molecular sieve, and recycling them back to the reactor. This separation occurs because of the difference in physical shape between the iso and normal molecules. The high octane isomers are routed to storage for blending into finished gasoline.

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