International Process Plants

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LDPE Plant
Total Capacity is 110,000 tons/year, Consisting of (3) lines

- Unit 12: 4.5 ton/hr
- Unit 13: 4.5 ton/hr
- Unit 14: 4.5 ton/hr
Compression Section

The compression section consists of three compressors:

Booster compressor (K101).
The booster compressor, compresses ethylene from the 0.3 bar buffer vessel (V101), in one stage, with after cooling (H101), to the 3 bar buffer vessel (V102). In vessel V102, the ethylene gas from the booster compressor is combined with the fresh ethylene stream.

Primary compressor (K102)
In the primary compressor, the ethylene gas from the 3 bar vessel (V102) is compressed, in five stages, with interstage cooling (H102-H105) and after cooling (H106) to approx. 250 - 300 barg. This stream is combined with the ethylene from the high pressure recycle and fed through the suction filters (S108/109/115/125) to the secondary compressor (K103).

Secondary compressor (K103)
In the secondary compressor, the ethylene is compressed in two stages with interstage cooling (H107/108/109/110) & after cooling (H228/229/230/231) from 250 -300 barg to approx. 1000 –2500 barg.
**Reaction Section**

The ethylene coming from the secondary compressor is fed to the reactor, an ICI type 600 liter HP LDPE autoclave reactor (R201). To initiate the reaction, peroxide injection, by means of high pressure pumps, is used. The discharge stream of the reactor, which contains LDPE polymer and unreacted ethylene, passes through a let down valve, to the high pressure separator (S231).

**High pressure separation and recycle section**

In the high pressure separator, operating at a pressure of approx. 250 barg, a phase separation takes place between the light unreacted ethylene phase and the heavy LDPE phase. The light ethylene phase stream is fed to the high pressure recycle coolers (H250/251/252/253/254) and separators (S250/251/252/253/254/255) in which cooling and separation of waxes take place. The stream from the high pressure cooling / separation section is combined with the stream from the discharge of the primary compressor and is fed to the secondary compressor. The heavy LDPE phase, containing approx. 25 mass% of ethylene, from the high pressure separator, is fed through a let down valve to the low pressure separator.
Process Description for Each Line

**Low Pressure Separation and Recycle Section**

In the low pressure separator, operating at a pressure of approx. 0.3 barg, the remaining ethylene is separated from the LDPE. The light ethylene phase stream is fed to a wax separator (S237) and is returned as the low pressure recycle stream to vessel V101. The heavy LDPE phase from the low pressure separator is fed to the hot melt extruder.

**Extrusion, Pelletizing and Drying Section**

The LDPE melt is fed by the extruder (P249/1) to the underwater pelletizer (P249/2). Separation between the water and LDPE pellets takes place in a separator (D201). The dried pellets are then transported by means of pneumatic conveying to the silos in the finishing plant.
Contact IPP Today!

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