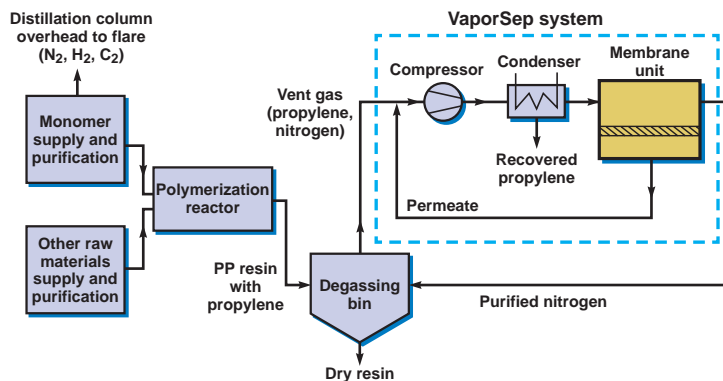


POLYPROPYLENE PRODUCTION

Problem

During the production of polypropylene (PP), a portion of the propylene feedstock is lost. The value of the lost feedstock is substantial, ranging from \$1 million to \$3 million per year for a typical polypropylene plant. Propylene losses occur primarily in resin degassing vents.

- Recovers valuable propylene and nitrogen with payback time of 1 year or less
- Minimizes installation cost with skid-mounted construction
- Simplifies operation with few or no moving parts



VaporSep® Solution

For resin degassing applications, the vent stream is compressed and then cooled to condense the propylene. The gas leaving the condenser still contains a significant amount of propylene. This gas is fed to the membrane unit, which separates the stream into a propylene-enriched permeate stream and a purified nitrogen residue stream. The permeate is recycled to the inlet of the compressor and then to the condenser, where the propylene is recovered. The purified nitrogen stream is recycled to the degassing bin.

For C₃ splitter overhead applications, the VaporSep® unit is very simple, consisting of membrane modules only, with no moving parts. The stream leaving the column overhead is primarily propylene, mixed with light gases such as N₂ or H₂. The VaporSep® unit splits this stream into a propylene-enriched stream and a light-gas-enriched stream. The propylene-enriched stream is returned to the distillation column, where the propylene is recovered, and the light-gas-enriched stream is vented or flared.

VaporSep® units are currently used by major polypropylene producers including Formosa Plastics, Ineos, SABIC, Sasol, and Sinopec.

“The VaporSep® unit has consistently surpassed the original design specification by recovering more than 95% of the hydrocarbons in the feed gas.”

POLYPROPYLENE PRODUCTION



This propylene/nitrogen recovery unit was recently started up in Asia.

Benefits

- Recovers valuable propylene with typical payback time of less than 1 year
- Purifies nitrogen for reuse in the process
- Minimizes installation time and expense with skid-mounted construction
- Reduces incineration and flare requirements
- Achieves significantly higher hydrocarbon recovery than possible by condensation alone
- Allows recovery at more moderate temperatures and pressures than condensation alone
- Minimizes footprint and weight
- Creates no secondary waste streams

System Performance

- Suitable for vent streams from 300 to 10,000 lb/h, with propylene concentrations from 10 to 80 vol%
- Propylene recovery up to 99+%
- Nitrogen recovery over 95% with purities of 99+ vol%

System Description

- Complete skid-mounted unit includes membrane modules, compressor, heat exchangers, piping, instrumentation, and controls
- Unit dimensions: 15 ft (L) x 10 ft (W) x 10 ft (H); 5,000 to 15,000 lb; compressor is mounted on a separate skid of similar size
- Conforms to typical petrochemical specifications (ASME, ANSI, PED, TEMA, NEC or IEC etc.)
- Control is by local PLC or through DCS

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