



FW/UOP Visbreaking Process

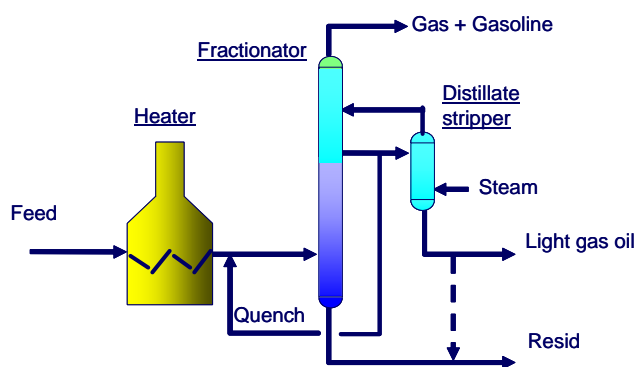
Visbreaking is a non-catalytic thermal process that converts atmospheric or vacuum residues via thermal cracking to gas, naphtha, distillates, and visbroken residue. Atmospheric and vacuum residues are typically charged to a visbreaker to reduce fuel oil viscosity and increase distillate yield in the refinery.

Advantages of the Foster Wheeler/UOP visbreaking process are:

- High sulfur fuel oil reduction
- Reduces distillate cutter stock requirements, making the distillate available for more valuable transportation distillate fuels
- Low cost upgrading (\$900 / BPSD US Gulf Coast basis)

There are two types of visbreaking technology that are commercially available: the 'coil' or 'furnace' type and the 'soaker' process. In the coil process, conversion is achieved by high temperature cracking for a predetermined, relatively short period of time in the heater. In the soaker process, which is a low temperature/high residence time process, the majority of conversion occurs in a reaction vessel or soaker drum, where the two-phase heater effluent is held at a lower temperature for a longer period of time.

Foster Wheeler has utilized both soaking coil and soaking drum technologies in the design of visbreakers and thermal crackers. A number of the units designed by Foster Wheeler have integrated visbreaking and thermal cracking sections.



In a 'coil' type operation, charge is fed to the visbreaker heater where it is heated to a high temperature, causing partial vaporization and mild cracking. The heater outlet stream is quenched with gas oil or fractionator bottoms to stop the cracking reaction. The vapor-liquid mixture enters the fractionator to be separated into gas, naphtha, gas oil and visbroken resid (tar). The visbroken bottoms are then blended with lighter materials (cutter stock) to meet fuel oil specifications. The fractionated visbreaker gas oil is often used as the cutter stock.

Visbreakers can be configured with vacuum flashers on the tar stream to produce more heavy gas oil distillate and can also be configured as two-stage visbreaker/thermal cracker for maximum yield of lighter distillates.