Gasoline wt%	17.8	61450	397
Gas oil wt%	41.3	142500	2779
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	100	345080	7940

H.W (1)

Feed RC of an 35.6 API gravity, C.O having 28.3 vol. % residuum with 8.4 % Conrad- son and 15.9 API, capacity 10000 BPD C.o. of 2.7 % Conrad son.

2) Visberaking

Visbreaking is a relatively mild thermal cracking operation mainly used to reduce the viscosities and pour points of vacuum tower bottoms to meet the requirements of fuel oil or to reduce the amount of cutting stock required to dilute the residue to meet the specifications. It is also used to increase catalyst cracker feed stocks and gasoline yields.

The principal reactions which occur during the visbreaking operation are :

1) Cracking of the side- chains attached to cyclo-paraffin and aromatic rings.
2) Cracking of resins to light HC (primarily olefins) and compounds which convert to asphaltenes.
3) At temperature above 900 ^{o}F some cracking of naphthene rings.

There are two types of visbreaker operation

1) Coil or furnace cracker

Uses high furnace outlet temperature (885-930 ^{o}F), and reaction time from 1-3 minutes. The feed is heated in a furnace or coil and quenched as it exits the furnace with gas oil or tower bottoms to slop the cracking reaction.

2) Soaker

The feed leaves the furnace at 800- 820 ^{o}F and pass through a soaking drum which provides an additional reaction time, before it is quenched.

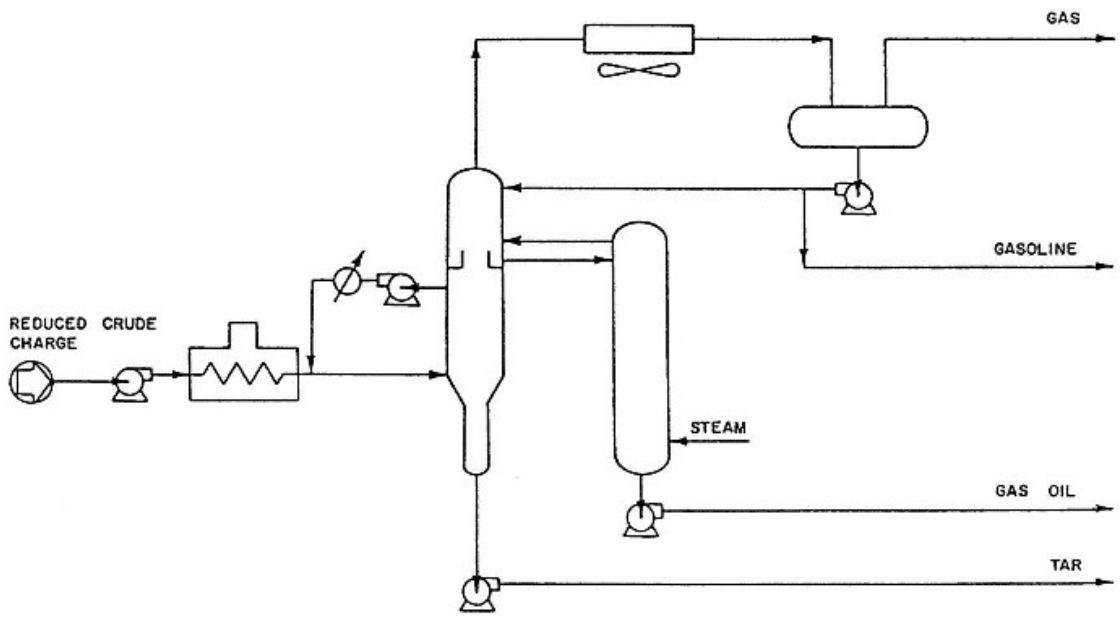

Fig 2 :Coil visbreaker (From Gary and Handwerk, 2001)

Catalytic Cracking

It has been the most important and widely used process for the production of gasoline from heavy distillates and hence the major means for increasing the ratio of light to heavy products from crude oil. **The catalytic-cracking processes in use today can all be classified as either moving-bed or fluidized-bed units:**

1) Moving Bed: In which the catalyst was allowed to fall slowly by gravity through the reactor and a regenerator vessels and was returned mechanically to the top.

2) Fluidized Bed: Is based on the fluidization propertied of fine powders, which enabled the catalyst to be transported continuously between the reactor and regenerator.

The fluidized system has been more widely used than the moving bed and now represents about 80 % of all cracking plants.

Catalyst : both systems use basically similar catalysts but produced in a different form, in the shape of beds for moving bed and fine powder for fluidized bed.

Acid treated clays ground to a powder

Synthetic silica- alumina catalysts of higher activity (amorphous)

Crystalline synthetic silica – alumina catalyst called zealots or molecular sieves.

The advantages of zealots over the natural and synthesis amorphous catalyst are

1) Higher activity.
2) Higher gasoline yields at a given conversion.
3) Production of gasoline containing a larger % of paraffinic and aromatic HC.
4) Lower coke yield.
5) Increased iso-butane production.
6) Ability to go for higher conversion per pass without over cracking.

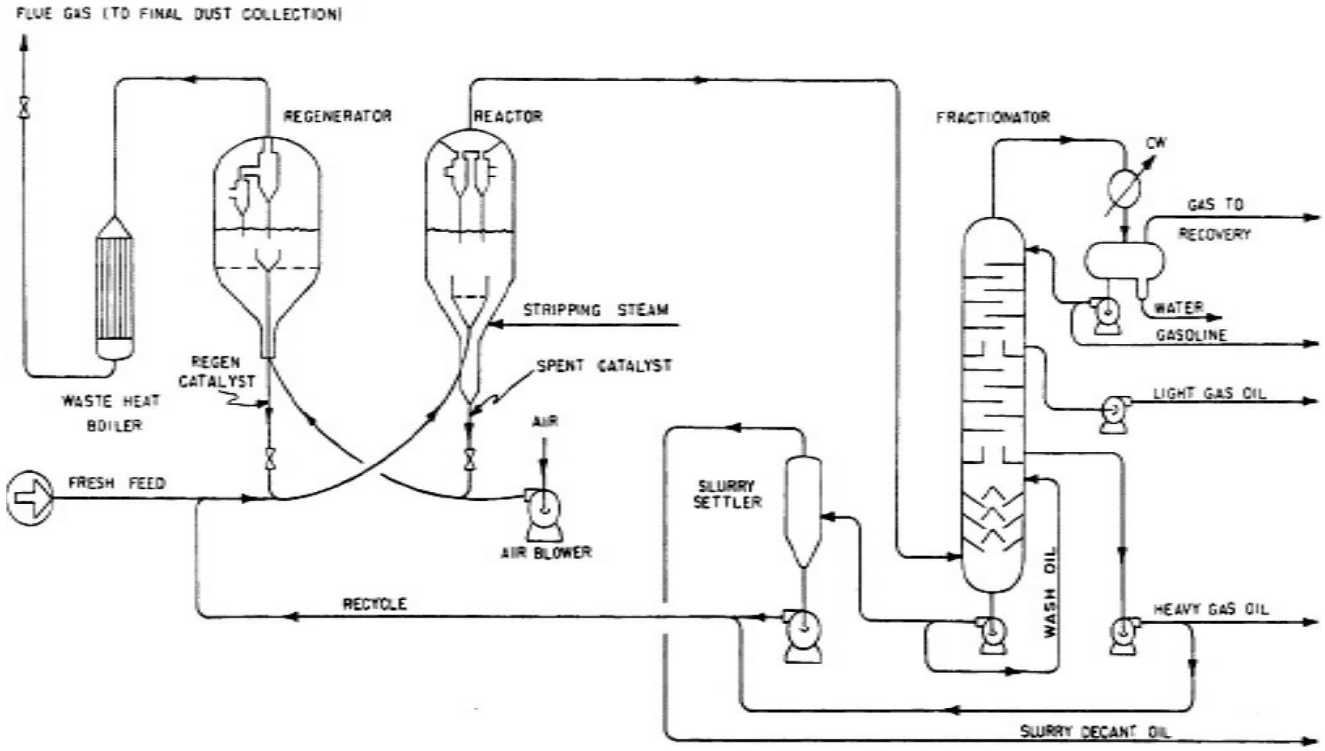

Fig 3: FCC unit (From Gary and Handwerk, 2001)