

DELAYED COKING TECHNOLOGY: RESIDUE CONVERSION

Introduction

Delayed Cokers can convert even the heaviest residues to lighter distillates provides much needed flexibility to the refiners to process a wide variety of crude oil and therefore, is the most widely used process all over the world.

IndianOil and Engineers India Ltd. (EIL) is jointly licensing the Delayed Coker technology by synergizing individual technological strengths. IndianOil R&D has developed the capability to predict product yields, process conditions and product properties for Delayed Coking process based on a state-of-the-art pilot plant and in-house developed process simulator/calculations. EIL has experience in process design and engineering for both open art and licensed units. EIL has already licensed five grass roots Delayed Coker units and carried out one revamp. All the units have been operating successfully in line with the design.

Process description

The process comprises feed furnace for heating up to the desired reaction temperature, coke drums in swing mode operation for allowing the residence time of feed to undergo thermal cracking reactions, main fractionators for separation into products of desired cut points and Gas concentration section to separate gas and LPG.

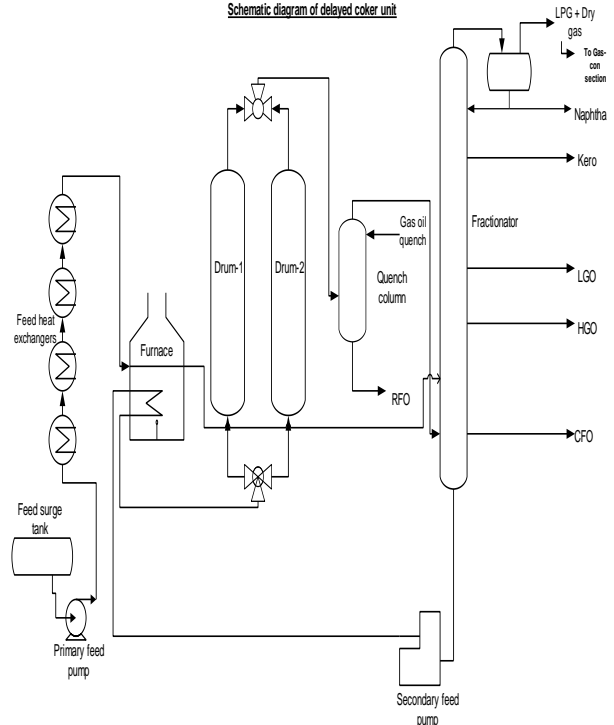
The typical operating conditions are:

Coil outlet temperature : 500-507°C

Reactor pressure : 1-3 barg

Recycle ratio : 5-10%

Schematic diagram of delayed coker unit



Salient Features

- Minimization of shot coke formation by parametric and feedstock quality adjustment.
- “Pit & Pad” combination for coke handling minimizing drum structure height.
- Automatic top and bottom un-heading Delta valve or Han & Clay for operator safety.
- Closed blow-down to minimize air pollution, water re-use (Maze system) and H/C recovery during drum cooling
- Online spalling giving two-year run length. Offline decoking by mechanical pigging, which is more efficient for non-organic fouling, e.g. iron sulphide and hard, coke.
- Interlocks for safe operation of chamber switch over valves.

- Double fired heater configuration ensuring:
 - Ratio of peak flux to average flux in radiant section reduction by ~30%
 - Uniform heat distribution
 - Lower heat transfer area
 - Shorter residence time (reduced travel length) and lower pressure drop
- Design of coke drum cycle from 16 to 24 hours.
- Refinery waste sludge disposal in drum quenching step.

Advantages

- Processing of wide range of feedstocks.
- Safe, reliable and well-proven technology, meeting all regulatory requirements.
- Design of fuel as well as anode grade cokers depending on feed quality.

Backup Strengths

- Proven expertise in design of fuel as well as anode grade cokers.
- Wide experience with commercial Delayed Coker units processing various feedstocks.
- Excellent technical support and troubleshooting expertise.
- Commercial /pilot plant data bank.
- State-of-the-art pilot plant facility for generation of basic design data with any new combination of feedstocks.

Contact details

Engineers India Ltd.
1, Bhikaji Cama Place,
New Delhi, 110066

Tel:

E-mail:

Website: www.engineersindia.com