

# DELAYED COKING PROCESS & APPARATUS -

(Patent Pending)

## The Technology called “Improved Delayed Coker Unit (IDCU)”

“IDCU” Technology has revolutionized the Delayed Coker processing by eliminating in-situ De-Coking process.

“IDCU” Technology is equally applicable to the Operating Delayed Coker Units and the New Ones.

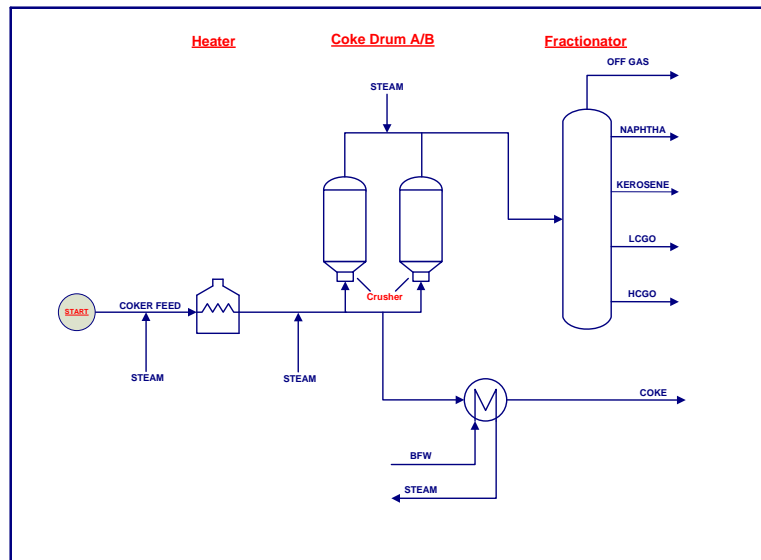


Figure 1

Improved Delayed Coker Unit (IDCU)

**Introduction:** The IDCU, IMPROVED DELAYED COKER UNIT, is a new and improved designed of the already proven Delayed Coking Technology, presently in use at many facilities across the world

**Application:** Improved Delayed Coking Technology is a Delayed and Fluid coker combination process to convert heavy hydrocarbons (vacuum residuum, extra heavy oil or bitumen) to full range lighter liquid products and coke.

**Description:** Improved Delayed Coking Technology greatly shortens the required duration of the alternating drum fill, decoking cycles and eliminates the need to perform drum quenching, draining, unheading, hydraulic decoking, reheating, and pressure testing procedures in the decoking cycle. This patent pending technology significantly improves coker efficiency, profitability, reliability and safety.

**Operation:** De-coking cycle includes simply a steam-out stage and a coke product removing step. The coke product produced in the coking drums is a hot, solid, flowable material from which heat can be recovered for producing steam. The flowable coke is directed to the pit or trucks.

Reaction proceeds at lowered cracked oil partial pressure by injecting steam into the drum, keeping petroleum pitch in a homogeneous liquid state and stripping the liquid out. Unlike a conventional Delayed Coker, a higher cracked oil yield can be obtained.

Driving force to remove the coke from drum, includes a pressure system to keep the drum at constant pressure during the De-coking process, a heavy duty Crusher located at the drum bottom to provide smaller particle size coke, and a lifting steam system to move the coke through the exchangers.

## **Benefits of “IDCU”**

- Increases Drum Capacity in excess of 200%.
- Greatly reduces coking cycle from 18 hours to 6 hours.
- Eliminates the potential damage to the coking drum, longer drum life.
- Significant Heat Recovery for Steam Production
- Eliminates Hydraulic De-coking, Heading and De-heading system, blowdown and related operations.
- Significant reduction in utility usage, O&M costs
- Significant Lower Capital Cost for New Installations
- Significant Increase in Volume of Liquid Products
- Significant Improvement in Quality of Liquid Products
- Reduces coke yield.
- Handles virtually any pumpable hydrocarbon feed

**Operation Conditions:** Typical range are:

Hater Outlet temperature, °F 950 -1000

Coke drum pressure, psig 10-50

Recycle ratio, vol/vol feed, % 0

FeedStock: Typical Middle East vac. Residue (Gravity, 7.3 °API, 23 wt% Concarbon, 4.8wt% sulfur):

Yields:

Light Ends, Wt% 7.8

Naphtha (C5-350 °F), wt% 14.3

Gasoil (350-650 °F), wt% 52.7

Coke, wt% 25.3

Economics:

Investment ( based on 12,500 bpsd )

2Q 2006 US Gulf, \$ per bpsd 2,500- 3,500

**Installation :** All existing delayed Coker can be converted to IDCU with minimum expense within a short time. Unit shut down is not required.

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