

Mustang Plays a Key Role in COLO Technology Projects

Coke Oven Light Oil (COLO) is a unique technology formed in a hydrotreating process. A by-product of the steel industry, Coke Oven Light Oil (COLO) is obtained during the thermal conversion of coal to coke. It is a highly aromatics material, composed primarily of benzene, toluene and xylenes, which are building blocks for a broad range of consumer products – from CDs to aspirin – that we rely on in our everyday lives. The raw COLO feedstock also contains certain contaminants: organic sulfur and nitrogen components and diolefins, and also contains styrene. The COLO hydrotreating unit is designed for pre-treatment and hydrotreatment of the COLO feed to remove unwanted heavier contaminants prior to aromatics recovery, without the excessive loss of the desired nitration grade benzene, and any loss of toluene or xylenes. The first step is to fractionate out C9+ impurities. Then there is a two-stage hydrotreating reaction section. In a moderately low temperature first stage, the styrene is partially saturated to ethyl benzene, as the styrene would otherwise polymerize in the next stage of hydrotreating. In stage 2, at the higher 300–400° C, sulfur and nitrogen containing contaminants are hydrotreated and removed.

COLO aromatics extraction technology is actively licensed by LyondellBasell Industries. The process is based upon a liquid-liquid extraction using sulfolane as agent and two-stage hydrotreating reactor design that features proper reactor sizing; liquid distribution; high contacting efficiency; and control of vaporization, pressure drop and temperature. The reactor is designed to be cost-efficient and practical

COLO
[Coke Oven Light Oil]

to operate, maximizing benzene recovery with minimal aromatics loss. LyondellBasell has commercial experience and pilot studies with their technology since 1982 and have either owned or licensed more than 30 Aromatics Extraction Units globally since that time.

Mustang was chosen by LyondellBasell as its engineering partner, to provide a Basic Engineering Design Package (BEDP) to LyondellBasell clients who license in size technology areas, including their COLO Hydrotreating and Aromatics Recovery technologies. BEDP is similar to a Front End Engineering Design (FEED) package preparation. Mustang assists LyondellBasell as they create a customized process design for each new unit, building in as much flexibility as each licensee might require.

To date, Mustang has been involved with five COLO Hydrotreating and Aromatics Recovery projects for LyondellBasell in China. Once Mustang has completed the BEDP, it hands off the project to a Chinese Design Institute (CDI) to perform the detailed engineering. Mustang and LyondellBasell often meet with the client and their CDI to review progress around the midpoint of the BEDP. At the end, to facilitate the transfer of each project, a delegation of project team members from the client and the CDI, detailed engineering firm spend time in Mustang's Houston offices reviewing the BEDP work and to make certain that the handoff goes smoothly.

The photos show the management team from a client company, Hongfa (Sha Steel), and key engineers and managers from its detailed design contractor, which for this project is Baosteel Engineering. The visual projection of the material on a screen is the preferred method for conducting the meetings. It is most useful for the Chinese delegation as the engineers have a working ability to read English, a requirement for college entrance. Speaking of English, however, is not mandatory and not widely practiced. Shortly after this delegation departed, another arrived to discuss and review a similar Chinese COLO project.

The agreement with LyondellBasell lets Mustang also assist in improving the LyondellBasell technologies included in the engineering support agreement, including the COLO Hydrotreating and Aromatics Recovery Process. Mustang also fully supports them as they offer technologies to potential licensees, and assist them with project development. This is an example how Mustang, as a technology-neutral contractor, can work closely with world-class technology licensors in a variety of processes and a multitude of process applications.

