

## Extractive Distillation

3 days

DISTEXT-EN-P

### Overview

#### LEVEL

Skilled

#### PURPOSE

This course provides a deeper technical understanding of an extractive distillation column, its principle and consequences on the operation of the whole unit.

#### LEARNING OBJECTIVES

Upon completion of the course, the participants will be able to:

know about the action of the solvent,

explain the meaning of the operating parameters,

analyze the effect of each parameter acting on the operation of the column and on the specifications of the products,

identify the most frequent disturbances and incidents.

#### WAYS AND MEANS

The content of this course can be adapted to the customer's needs. The pedagogy is focused on the units concerned, under cover of a secrecy agreement if necessary.

Implementation of static simulation results with C<sub>4</sub>/ACN and C<sub>6</sub>/NMP processes.

The case studies are dealt with in group and based on typical situations encountered in the operation of the related process units.

#### LEARNING ASSESSMENT

Quiz.

#### PREREQUISITES

To fulfill at least one of the following criteria: to have at least 1 year's proven experience in a refinery or chemical or petrochemical site equipped with distillation columns.

## Agenda

### SOLVENT EFFECT ON VAPOR-LIQUID EQUILIBRIA

0.75 d

Typical composition of cuts to be processes: C<sub>4</sub> and C<sub>6</sub> cuts of a steamcracker or other units.

Natural volatility of compounds and focus on impurities to be removed, highlighting constraints and available processes.

Action of the solvent and effects on relative volatilities of the compounds to be separated.

Effects of pressure, solvent ratio and feed composition.

### BEHAVIOR OF AN EXTRACTIVE DISTILLATION COLUMN

0.75 d

Feed composition. Required specifications.

Mass balance, product recovery ratio, losses of solvent.

Analysis of operating parameters: pressure and its pressure control system, solvent ratio, solvent temperature, thermal balance and vapor-liquid traffics.

Concentration profile: hydrocarbons and solvent, behaviors in extractive and non-extractive zones.  
Meaning of temperatures and of temperature profile.

## DOWNSTREAM PROCESSES

0.5 d

Solvent recovery system and purification.

Make-up of solvent and adjustment of its composition in the solvent loop.

Superfractionation if needed.

## OPERATING VARIABLES OF AN EXTRACTIVE DISTILLATION COLUMN

0.5 d

Instrumentation and process control scheme.

Meaning of controlled parameters.

Impact of the modification of: solvent ratio, reboiler ratio, solvent composition and temperature and other parameters depending on the process configuration. Consequences on the yields, the composition of products and the energy consumption.

## TROUBLESHOOTING & PROCESS INCIDENTS

0.5 d

Solvent: decrease in flowrate, temperature modification, regeneration failure.

Feed: unexpected change in flowrate or composition.