



Our Business is Knowledge Transfer

Hydrocracking Processes

A Eurotek training course



ERS Hydrocracking Processes

An introduction:

Refiners worldwide face increased regulation and demand for ultra clean transportation fuels. Economics drive refiners to maximise the yields and conversion of their ever increasing heavy crude oil feedstocks. More and more refiners are turning to hydrocracking to meet these challenges. The ERS Hydrocracking course is a comprehensive core skills course for professionals dealing with all aspects of Hydrocracking units. The course will be highly valuable to all engineers involved in the operation, design and troubleshooting of Hydrocracking facilities.

Learning objectives:

Upon completion of this course, participants will have gained a solid understanding of the key elements of:

- Hydrocracking Chemistry,
 - Equipment purposes,
 - Processing Objectives,
 - Design,
 - Operation,
- of Hydrocracking Units.

This will include the impact of:

- Feed quality,
 - Catalyst,
 - Operating conditions,
 - Unit design,
- on product qualities.

and some very practical insights into:

- Monitoring
- Troubleshooting
- Optimisation
- Safe operation



Who should attend?

ERS Hydrocracking is a comprehensive core skills course for professionals dealing with all aspects of the Hydrocracking units.

The course will be:

- Invaluable to all engineers involved in the operation, design and troubleshooting of Hydrocracking facilities.
- Highly useful to technical and operations planning personnel needing a perspective of how Hydrocracking fits into the operation of a complete refinery.
- A provider of knowledge of what matters in Hydrocracking to those who are experienced in other refinery processes and Managers of Hydrocracking Processes

Description:

The course is aimed at giving a practical overview of VGO & Resid hydrocracking. Today, refiners are faced with the challenge to maximise the yield of clean transportation fuels from crude oil. Hydrocracking provides the means to produce maximum low sulphur distillates, particularly kerosene, jet and diesel. This course provides a detailed overview of hydrocracking technology and covers the general theory and principles of hydrocracking chemistry and reactor kinetics. The course also covers the practicalities and impacts of hydrocracker design, feed effects and process variables. The third section covers plant monitoring, troubleshooting, product recovery and emergency procedures. A special section has been added that focuses exclusively on residuum processing.

This course will address both vacuum gas oil and residuum Hydrocracking, it will explain the differences and advantages of the different processes and configurations as well as giving a detailed review of the fundamentals behind hydrocracking technology.

This course provides an in depth yet practical review of hydrocracking technology today. The course will cover both theory and practical applications including a detailed look into the design, monitoring and troubleshooting of hydrocrackers.



Course Presenter

Mr. John Bauld has 40 years experience in Refinery Operation, Technical Support, Training and Management. He is a Chemical Engineer from Strathclyde University, Scotland. In the former Mobil refinery near Lough, England he progressed through Plant Engineer for numerous processes and projects to Shift Supervisor and Plant Supervisor/ Area Manager roles.

After moving to Exxon Engineering, based in London, he guided on-going operations in European refineries. He has been instrumental in reducing capital and operating costs and in improving plant reliability through innovation and training, particularly in Hydroprocessing, Reforming, Gas Treating and Sulphur Recovery. He has extensive experience establishing design requirements, economic evaluation and licensor/ contractor selection, start up, troubleshooting, training and mentoring activities with Mobil, Exxon & Licensees and KBC Process Consultants including extensive.

He is a Chartered Engineer and a Fellow of the Institution of Chemical Engineers (UK) and currently consults and trains for international clients. He has wide personal interests including playing Classical Guitar and Church Bell Ringing.



Course programme

Day 1

Introduction and Basic Terminology

- Hydrocracking role in a refinery
- Feed and product qualities
- History of Hydrocracking
- Hydrocracking reactions

Design Basics and Safety

- Unit design features
- Process and operating variables
- Special safety concerns

Hydrocracking Catalysts

- Nature of hydrocracking catalysts
- Amorphous Silica Aluminas
- Base and Noble Metal Zeolites
- Composition and activity
- Catalyst selection and reactor loading
- Catalyst Regeneration

Operating, Monitoring and Troubleshooting

- Data and models
- Constraints
- Catalyst deactivation

Q&A Session for Day 1 Topics

Day 2

Feeds Effects

- Cracked Stocks
- High Nitrogen Content
- Crude Change Reactivity
- Impact of End Point, Asphaltenes etc

Hydrocracking Configurations

- Single Stage Once Through
- Single Stage Recycle
- Two Stage
- Product Yields and Properties

Reactor Internals

- Developments in internals design
- Reactor loading and unloading

Process Variables

- Impacts of Space Velocity
- H2 Partial Pressure

Revision of Basics

Q&A Session for Day 2 Topics Case Studies – Session 1

Day 3

Residue Hydrocracking.

- Resid Chemistry
- Hydrotreating
- Fixed Bed Types
- Hoil & LCfiner Units

Product Recovery

- Exchangers, separators, strippers and compressors
- Fractionation

Refinery Hydrogen Balance

Emergency Procedures

- Loss of Feed
- Loss of Recycle Gas

Q & A Session

