

Biodiesel Production

AXENS ESTERFIP-H

OPERATIONS TRAINING

Objective: To provide in-depth knowledge of the **ESTERFIP-H** process and particularly the client's unit. By the end of the course, the participants will have:

- A general understanding of the significance of the unit within the refinery scheme
- A broad technical understanding of the catalyst and the chemical reactions involved in the process
- A solid knowledge of the Process Flow Diagram and equipment
- A thorough knowledge of operating conditions and their impact on performance
- A good overview of the start-up and shut-down activities (NB: a detailed review of procedures is not included in the course).
- A sound knowledge of the main troubleshooting actions

Duration: The training course lasts 3 days. The duration can be tailored to the participants' level of understanding.

Attendance: This training is targeted for unit process engineers, unit technical managers, shift leaders, and board men. Suitably qualified or experienced outside operators may attend to enhance their process knowledge.

Program: The program below may be modified due to specific customer requirements, subject to an agreement between the customer and AXENS.

Esterfip-H: biodiesel production

Day 1

1. Introduction

- Supply/demand situation
- Market trends
- Environmental regulation
- Focus on the unit in its context

2. Process Objectives

- General information
- Feed characteristics
- Unit duty
- Products' specifications
- Material Balance

3. Chemical Reactions

- Chemistry and catalysis basics
- Feed chemical composition
- Chemical reactions
- Catalysts
- Catalyst contaminants

Day 2

4. Process Description

- Process Flow Diagrams
- Piping & Instrumentation Diagrams
- Main equipment (Drawings, pictures and functions)

5. Start-up Preparation

- Pre-commissioning operations
- Commissioning operation:
 - Leak tests
 - Dry out
 - Inerting
 - Catalyst loading...

Day 3

6. Main Start up Operations

- Detailed description of the steps involved in introducing fresh feed:
 - Resins drying
 - First reactor catalyst drying
 - Second reactor catalyst drying
 - Ester circulation
 - Methanol introduction
 - Glycerol section start up
 - Oil introduction

7. Normal Operation and Operating Parameters

- Summary of main operating conditions
- Operating variables
- Adjusting operating conditions
- Analytical control

Day 4

8. Shutdown and Restart

- Planned shut-down
- Normal restart

9. Emergency Situation Description

- Emergency procedures
- Interlocks

10. Catalyst Special Procedures

- Handling
- Unloading

11. Resins Beds

- Resin loading
- Resin regeneration sequence
- Analytical follow up of ester product
- Resin unloading

12. Health, Safety and Environment

13. Quiz