



THE CHEMICAL ENGINEERING MAJOR

Principles of Chemical Cleaning and Its Applications

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Who Should Attend?

Engineers, operators and lab chemists who deals with Process, Materials and Corrosion Control.

Methodology:

This interactive Training will be highly interactive, with opportunities to advance your opinions and ideas and will include;

- Lectures
- Workshop & Work Presentation
- Case Studies and Practical Exercise
- Videos and General Discussions

Certificate:

BTS attendance certificate will be issued to all attendees completing minimum of 80% of the total course duration.

Objectives:

An intermediate course to develop the engineers and operators deals with Materials and Corrosion Control about chemical cleaning principle, uses, procedures, and its applications.

Contents:

Principles of chemical cleaning:

- Sampling and solubility testing prior to chemical cleaning.
- Which chemicals are useful?
- Chemical cleaning techniques are varied.

Chemical cleaning equipment:

- Components for field use.
- Mobile chemical cleaning rigs.
- Centralized facilities.
- Typical chemical cleaning tanks for field and shop use.
- Use of standard fittings for chemical connections.
- Typical acid cleaning rig and transporter.
- Typical exchanger cleaning area.

Coolers and condensers :

- Off stream cleaning techniques.
- On-stream cleaning is preferred method.
- Air side of air fin exchangers.

Process side deposits:

- Techniques for chemically cleaning exchangers.
- Techniques for chemically cleaning towers.
- Which solvent do you choose?
- Techniques for cleaning piping and pipelines.
- Techniques for cleaning furnace tubes.
- Techniques for cleaning miscellaneous equipment.
- Techniques for cleaning to achieve low sulfur standards (catalyst conversion).

Steam generators:

- Deposits in low pressure boilers.
- Deposits in high pressure boilers.
- How much deposit can you tolerate.
- Determining boiler cleaning schedules.
- Recommended procedure for determining cleaning frequency.
- How to select a boiler cleaning process.
- Cost of cleaning varies according to amount of deposit.
- Cleaning non-drainable and non-ventable systems.
- Preparation for acid cleaning (HCl or citric).
- Alkaline detergent wash for oil and grease removal.
- Boiler cleaning with hydrochloric acid.

- Boiler cleaning with ammoniated citric acid.
- Boiler cleaning with chelating agents (dow vertan 675 or halliburton macor).
- Testing and post cleaning inspection.
- Post cleaning passivation and start-up.