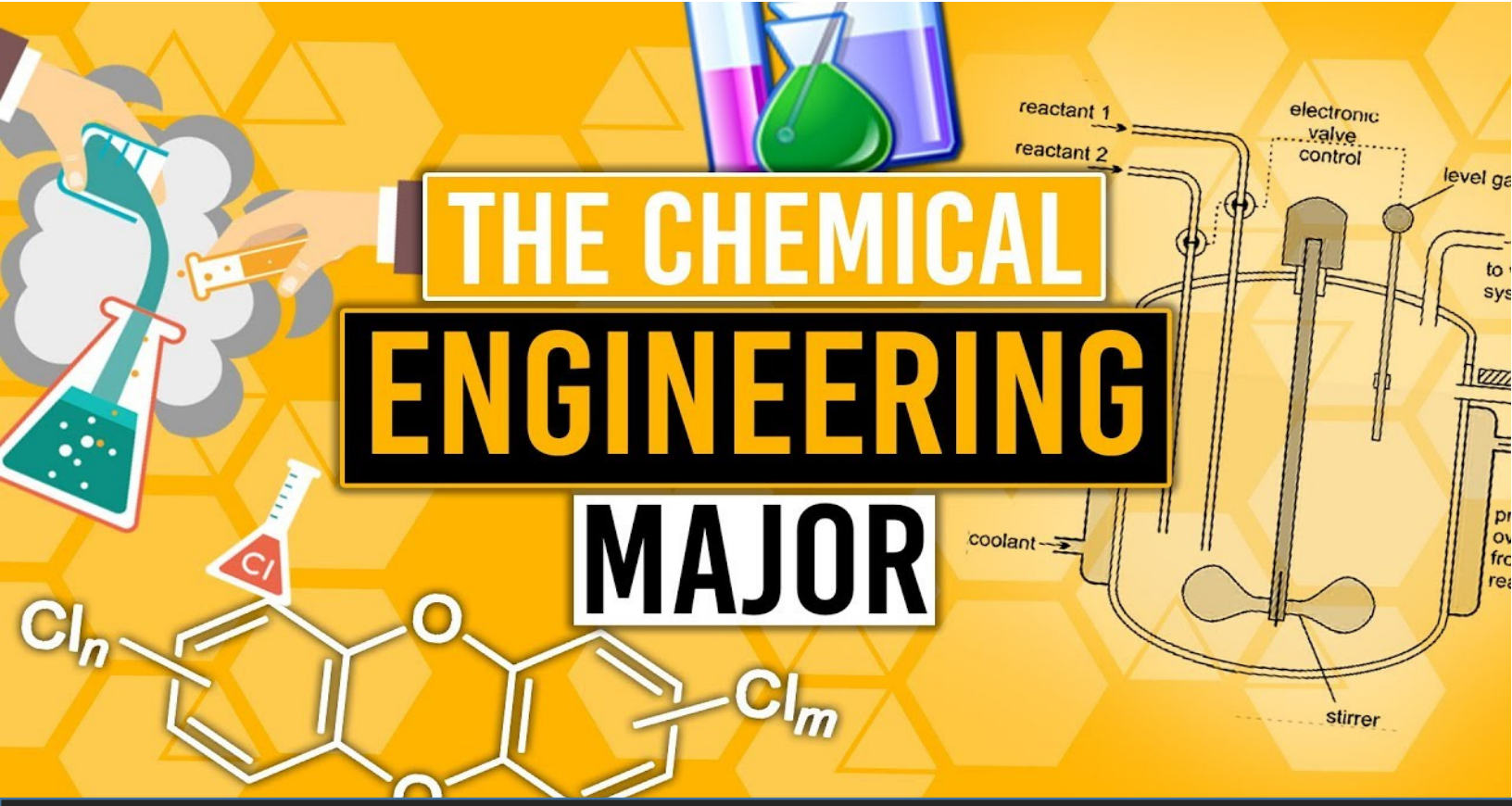

Demineralized Water Production and Polishing

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Training & Consultancy

Demineralized Water Production and Polishing

Description:

Natural water includes suspended solids, microorganisms, dissolved salts (ions) and dissolved gases, which cause various problems in systems. In drinking water, suspended solids and microorganisms must give a bad influence on the human health. In cooling water systems and boiler systems, hard soluble matter, such as calcium carbonate, may deposit as a scale on the heat transfer surfaces of heat exchangers and boilers. Then their thermal efficiencies are reduced by scaling. Dissolved oxygen causes corrosion of metals composed of those systems and shortens their service lives. Microorganisms may grow and form slime (biofouling) on heat exchanger tube surfaces, etc., slime adhesion reduces thermal efficiencies of heat exchangers and sometimes causes under-deposit corrosion or microbiologically influenced corrosion (MIC).

Even when water of same quality is used, the kinds and the degrees of problems caused by water vary depending on the usages of water and the operational conditions of systems. Therefore, the application of a suitable water treatment program is inevitable to prevent problems caused by water. The selection of the program must be carefully carried out considering the water quality, usage of water, operational conditions all of these points will discuss in our course.

Course Objectives:

In area of water treatment and process treatment chemicals, we have made technological improvements to ensure efficient operation and contribute to water and energy conservation in various water systems. We have also addressed critical issues surrounding water system treatment, such as the reduction of environmental impact through the development of non-phosphorus boiler compounds, non-hydrazine oxygen scavengers, and low- or non-phosphorus cooling water treatment chemicals. In addition, we have focused on the important task of ensuring work safety and chemical-handling safety.

We believe that this course will proof of our commitment to quality of water technologies, and to environmental preservation and improvement. By the end of the training course, the delegates will be able to select the appropriate technology for their water treatment plants and protect their industry and surrounding environment.

Who Should Attend?

This course is designed for Supervisors, Engineers, Chemists and Technicians responsible for water treatment technologies in plants.

Course Agenda:

DAY ONE: Introduction to water treatment

- History and Terminology
- Source Water Quality Considerations
- Necessity of Water Treatment
- Basic Chemistry for Water Treatments
- Chemical and Physical Properties of Water
- Water Borne Impurities
- Nature and Source of Water Pollution
- Problems caused by Impure Water
- Evolution of Water Treatment Technology
- Selection of Water Treatment Processes

DAY TWO: Water treatment technology

- Treatment Process Configurations
- Preliminary Treatment
    - Raw Water Storage
    - Algae, Algal Control, and Reservoirs
    - Fine screens and Pre-chlorination
    - Aeration and Pre-settlement basins
- Primary Treatment
    - Coagulation

    - Flocculation
    - Sedimentation and Flotation
    - Clarification
- Secondary Treatment
    - Filtration
    - Disinfection

DAY THREE: Water Demineralized Process Technology

- Treatment for Cooling Water System
- Internal Treatment for Boiler feed water
- Chemical Desalination Process Technology
    - Water Softening
    - Ion Exchange (Cations & Anions)
    - Mixed bed polishing
    - Softening and Demineralization
- Thermal Distillation Desalination:
    - Multi-Effect Distillation (MED)
    - Multi-Stage Flash (MSF)
    - Membrane Distillation
    - Vapor Compression

DAY FOUR: Water Demineralized Process Technology

- Membrane Desalination:
    - Reverse Osmosis (RO)
    - SWRO - Sea Water Reverse Osmosis
    - BWRO – Brackish Water Reverse Osmosis
    - ED – Electro Dialysis
- Freezing Distillation Desalination
- Hybrid desalination plant: composed of (MSF or MED) and an RO plant.
- Sizing of water Desalination plants
- Costs for desalination plant
- Chemicals used in water treatment

DAY FIVE: Water treatment chemicals & analysis

- Water clarifier & Coagulation chemicals
- Oil/ water Emulsion breakers, Oil dispersion
- Polymers - Water Treatment
- Water Disinfection Chemicals
- pH Adjusters
- Corrosion & Scale inhibitors
- Antifoams & Defoamers
- Oxygen Scavengers
- Membrane Reverse Osmosis (RO) chemicals
- Microbiological control & biocides
- Water Softening Chemicals

- Source water quality considerations
- Recommended feed-water analyses
  - pH acidity and alkalinity, Turbidity
  - Total Hardness, P, M & OH Alkalinity
  - Total Solids (TS): Total Dissolved Solids & Total Suspended Solids
  - Oxygen Demand (DO, COD, BOD)
  - Organic contaminants & Toxic Organic Compounds
  - Nutrients, Chloride, Cyanide analysis
  - Pathogenic microorganisms
  - Sulphite, Phosphate analysis
  - Oil and Grease analysis, Inorganic Chemicals
- Interpreting water analysis test results
- Water regulations