



## Water Treatment Series

Water treatment is vital worldwide to remove contaminants from water and make it acceptable for a wide range of uses. The TTS Water Treatment Series provides general information about the processes necessary to produce water that meets the specific requirements for its usage. The Water Treatment Series consists of 10 modules divided into 4

### Overview of Water Treatment

#### Overview

- Overview
- Applications
- Water Treatment Processes
- Advantages and Disadvantages of Water Treatment

### Raw Water Treatment

#### Clarification

- Clarification
- Theory of Operation
- Sampling

#### Sedimentation

- Sedimentation
- Sedimentation Basins
- Theory of Operation for Sedimentation Basins
- Factors that Affect Performance
- Sampling and Analysis

#### Disinfection

- Disinfection Processes and Selection Criteria
- Chlorination
- Ultraviolet Systems
- Ozone Systems

### Basic Water Purification

#### Water Softening

- Water Softening
- Terminology
- Major Components
- Theory of Operation
- Common Applications

#### Media Filtration

- Media Filtration
- Introduction to Water Filters
- Factors That Affect the Filtration Process
- Types of Filters

#### Ultrafiltration

- Membrane Filtration Overview
- Major Components
- Theory of Operation
- Advantages and Disadvantages

### Advanced Water Purification

#### Reverse Osmosis

- Purpose of Reverse Osmosis
- Principles of Reverse Osmosis
- Industrial Applications
- Advantages and Disadvantages

## **Resin Bed Demineralizers**

- Resin Bed Demineralizers
- Demineralization Processes
- Major Demineralization Components
- Theory of Operation

## **Electronic Deionization**

- Electronic Deionization
- Advantages and Disadvantages of Electronic Deionizers
- Major Electronic Deionizer Components
- Theory of Operation for Electronic Deionizers

## **Drinking Water Treatment**

### **Corrosion Control Treatment**

- Corrosion Overview
- Corrosion Control Treatments and Chemicals
- Chemical Feed Systems

### **Disinfection**

- Disinfection Overview
- Gas Chlorination
- Hypochlorite
- Ultraviolet Disinfection
- Ozone Disinfection

### **Distribution Systems**

- Distribution Network Components
- Distribution System Customers' Demands and Their Effects
- Types of Storage Facilities
- Water Quality

### **Drinking Water Fundamentals**

- Water Treatment Responsibilities
- Water Systems
- Types of Water
- Aquifers

## **Filtration I**

- Conventional Filtration
- Direct Filtration
- Diatomaceous Earth Filtration

## **Filtration II**

- Slow Sand Filtration
- Bag Filtration and Cartridge Filtration
- Membrane Filtration

## **Inorganics Removal**

- Inorganic Contaminant Basics
- Inorganic Removal Chemistry
- Inorganic Treatment

## **Organics Removal**

- Overview of Organics
- Control and Treatment Methods
- Source Control
- Air Stripping
- Adsorption

## **Wastewater**

### **Basics of Chemical Feed Systems**

- Overview
- Types of Chemical Feed Systems

### **Disinfection and Chlorination**

- Disinfection and Chlorination Principles
- Chlorination Process Control
- Chlorine Safety and Handling
- Chlorination Equipment and Maintenance

### **Effluent Polishing**

- Overview
- Chemicals
- Filtration Methods

## **Introduction to Wastewater Treatment**

- What is Wastewater?
- Primary Wastewater Treatment Processes
- Secondary Treatment Processes
- Advanced Treatment Processes
- Disinfection
- Solid Disposal and Handling

## **Laboratory Overview**

- Equipment
- Definitions
- Chemical Hygiene Lab Safety

## **Odor Control**

- Safety and Maintenance
- Classification and Prevention
- Types of Water
- Aquifers

## **Rotating Biological Contactors**

- Overview
- General Operation and Maintenance
- Advantages and Disadvantages of RBCs

## **Sampling**

- Sampling
- Quality Assurance and Control
- Reporting

## **Activated Sludge I**

- General Description of the Activated Sludge Process
- Aeration
- Typical Operational Problems
- Safety

## **Activated Sludge II**

- Modifications of the Conventional Activated Sludge Process
- Sequencing Batch Reactor
- Ancillary Treatment
- Operating Guidelines

## **Solid Handling and Disposal**

- Sludge Thickeners
- Anaerobic Digestion
- Aerobic Digestion
- Solids Management Planning

## **Supplemental Removal**

- Options for Phosphorus Removal
- Equipment Requirements
- Operational Considerations
- Phosphorus Removal by Alum Flocculation
- Nitrogen Removal

## **Treatment Ponds and Lagoons**

- Overview of Ponds and Lagoons
- Naturally Occurring Processes
- General Operation and Maintenance

## **Overview of Trickling Filters**

- Overview of Trickling Filters
- General Operation
- Maintenance
- Startup

## **Wastewater Collection Systems**

- Types of Collection Systems
- Types of Pumping Stations
- Pumping Station Well and Equipment