

# Piping Design & Drafting



## MODULE I: DETAILING

### Introduction to Plant & Site Engineering

- Introduction to EPC Industry
- Over view of an Engineering Organization & Plant Engineering function
- Piping Design Methodology for Petro-chemical, Oil & Gas, Refineries, Pharmaceutical, Power Plant, Steel Plant, Cement Plant etc
- Fundamental of Process Piping
- Piping Codes & Standards – ASME ,ASTM & API
- Environmental & design considerations
- Testing, Troubleshooting & Maintenance of Mechanical Equipments
- Mechanical Protection & Safety Consideration
- Role & Responsibility of Mechanical Engineer in Various Industry

### Fundamental of Piping Design & Pipe Class

- Pipe Abbreviation & Symbols
- Line Designation table
- Piping line lists
- Control Point & Battery Limit
- Line Size & Specs book details
- Pipes & Pipe Classes
- Introduction of P&ID ,PDS & PFD

### Piping System & Design Standards

- ASME Standard for common Piping Elements
- Introduction to B31.3 Process piping codes
- Fundamental of Pipe & their types
- Difference Between Pipes & Tube
- Pipe Designators-NPS, IPS, NB, Pipe wall Thickness & Schedule , Pipe Weight, Length, Grades
- Pipe Rating & Piping Symbols
- Pipe dimensions and pipe representation
- Drum Piping, Pump Piping, Compressor Piping, Heat Exchanger Piping, Column Piping,
- Tank Piping, Pipe Rack Piping

### Pipe material & material Specification

- Material properties
- Classification of materials
- Material specifications (ASTM)
- Common piping materials
- Piping Material Specification(PMS)
- Material selection

## **Fundamental of Pipe & Pipe Fittings**

- Types of Pipe Fitting
- Fitting dimensions and data tables
- Pipe Bends
- Branch Connections & Branch Reinforcement
- Pipe joining methods
- Reducers, Expenders Offset Calculations.
- Union /Tees / Elbows
- Weld Cap & Plugs.
- Stub End & Their Types
- Joining Methods
- Types of Couplings

## **Pipe Flange & Gaskets**

- Basics of flanges & Their Requirements
- Flange ratings and flange types
- Flange data tables and their sizes
- Flange Facing & Flange Face Finish types
- Gasket types & Thickness
- Nuts & Bolts

## **Pipe Hydraulic & Calculation**

- Pipe Hydraulic System
- Flow rate, velocity & pipe size calculations
- Reynolds number- laminar/turbulent flow
- Darcy weisbach ,Hazen William ,Colebrook White Equation
- Moody Diagram
- Minor Losses in Pipe Fitting & their Calculation using Nomographs and Chart
- NPSH calculations ; Pressure drop calculations
- Pump Calculation ; Head loss calculations
- Friction Factor

## **Pipe Insulation & Heat Tracing**

- Introduction of Insulation
- Introduction of Heat Tracing
- Preparing an Insulation Specification
- Data Required for Making an Insulation Specification

## **Selection & Sizing of Mechanical Valves**

- Basics of Valves
- Types of Valves
- Operation & Function of Valves
- Control Valve Manifold
- Valves Trim, Defects & Operators
- Valves Selection
- Valve Data Sheet

## **Mechanical & Process Equipments**

- Typical equipment specifications
- Process equipment [Reactors, Towers, Exchangers, Furnaces, Vessels,Columns
- Mechanical equipment [Pumps, Compressors, Storage tanks] MODULE

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## MODULE II : DRAWINGS & PROCESS PLANT LAYOUTS

- Mechanical Symbols Abbreviation standards Legends
- Plant layout specifications
- Plot Plan Development
- Piping Layouts
- Piping Rack , Spacing & Routing Layouts
- Equipment Layouts
- Pipe Isometrics Drawings
- Piping GA Drawing
- Preparation of BOQ/MTO As per drawings

## MODULE III : SYSTEM STUDIES

- Equipment Modeling
- Pipe Design
- Pipe fitting Assembly
- Nozzle Elevation
- Draft & Isodraft

Partners :



Java



development | consultancy | training

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