

FACT SHEET

ASME B31.12 | Hydrogen Piping and Pipelines



Design and construction of safe and economical Hydrogen Piping and Pipelines Systems using ASME B31.12

Who Should Attend?

This course is intended for **graduates (or soon to be), designers, freelancers, technicians and engineers** involved in: calculation, design, selection, manufacturing, safety, quality and maintenance of systems and equipment in industrial processes.

No prior knowledge of this topic is required.

Training Objectives

The main objective of this course is to **transfer to participants the theoretical and practical skills required in projects**, obtained from experience and sound engineering practices.

What to Expect?

Get familiar with the **main configurations** of Hydrogen piping and pipelines.

Get to know the **B31.12 code organization**.

Understand the **general requirements** of these systems, such as materials, brazing, welding, heat treating, forming, testing, inspection, examination, operating, and maintenance.

Design and **calculate** pipe wall thicknesses and other key variables for hydrogen industrial piping systems and pipelines.

Deep-dive into **best-suited materials** for hydrogen Piping and Pipeline Systems.

Understand key aspects involved in the **repurposing** of natural gas pipelines for hydrogen service.

Course Duration

Full Course: 40 hs; to be completed in 60 days. The Virtual Campus will be open for 120 days (flexibility).

Methodology

At your own pace

Available 24/7, Self-paced course

“Learn by doing” concept

No scheduled sessions

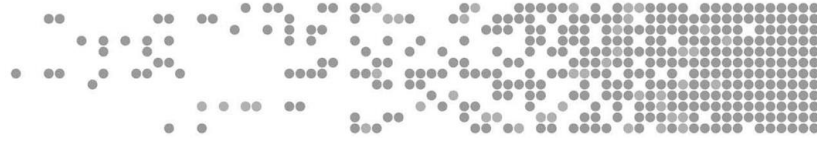
Included in the course

Study Notes

Summary Videos

Conceptual Questions

Virtual Campus access



Contents

ASME B31.12 – Code Section Overview

Scope and General Requirements

Industrial Piping Systems

Pipelines

Appendices

Hydrogen Characteristics

Hydrogen properties

Properties as a fluid | Compressed and liquefied state

Permeation and Embrittlement

B31.12 GR – General Requirements

Materials

Materials for hydrogen service | Welding and Brazing | Heat treatment

Forming of pipe components

Inspection, examination, and testing

Operation and Maintenance plan

Quality System

Abandonment and decommissioning

B31.12 IP – Hydrogen Industrial Piping

Scope

Design

Design conditions and criteria | Allowable stresses | Weld joint quality factors | Pressure design of piping components

Components

Branch connections | Closures, Flanges and Reducers

Valves and specialty components | Piping Joints

Dimensions and rating of components

Flexibility Analysis and supports

Instrument and pressure-relieving piping

Fabrication, erection, and assembly

Examination requirements. Leak testing and other testing

B31.12 PL – Gaseous Hydrogen Pipelines

Scope

Components

Valves, Flanges and other pipeline fitting components | Branch connections.

Loads

Expansion, flexibility and longitudinal stress | Cyclic loading

Supports and anchorage

Provisions for design. Steel pipe design requirements

Bends, elbows and miters. Hot taps

Precautions and testing

Location classes and risk assessment | Pipeline protection | Precautions during construction | Testing and commissioning

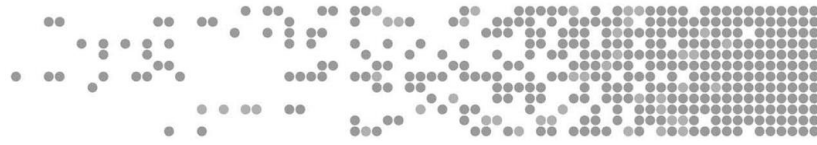
Control and limiting of pressure

Valves, meters and regulators | Service lines

Inspection and examination

Steel pipeline service conversion

Appendices



Instructor

Senior Mechanical Engineer with a focus in management. **More than 31 years of experience in design, calculation and fabrication of piping systems and equipment**

Duties of the above-mentioned positions range from the initial conception of pipes and static equipment to their delineation, design, calculation, purchase, approval of vendor documentation, and commissioning. Among the developed projects, clients such as SHELL, EXXON, REPSOL, CHEVRON, GALP, CEPESA, TUPRAS and SAUDI ARAMCO stand out.

Extensive experience providing specialized training sessions in both classroom and online methodologies. More than 50 training courses carried out in different institutions and in-company, courses oriented to graduates, designers, engineers and experienced professionals.

Tailored Training

The most effective training is one that satisfies the needs of each company's business focus and deliverables. **We adapt our training programs to each specific requirement, offering bespoke solutions for each need.** The result, 100% tailored programs, developed to maximize the time investment and deliver tangible and intangible returns to the work teams.

After an assessment phase, a tailored training plan is designed jointly with the client. This plan is specifically tailored to meet the client's needs, focusing on effectively enhancing the capabilities of the work team. **We provide practical, dynamic and hands-on training,** making available the best instructors in each subject.

Arveng Training

Arveng Training has developed effective and practical solutions for today's industrial challenges by delivering specific, high-quality engineering courses utilizing three different approaches: **classroom, online, and tailored training.** We are proud to have imparted more than 250 classroom courses, 1200 online courses, and over 65 in-company sessions. Our training activities have benefitted over 4500 professionals, our greatest accomplishment of all.

We consider our students' time to be of utmost importance. For this reason, all our courses have been designed with the main objective of quickly improving the professional skills of the participants through our expert instructors in different disciplines. **We stimulate creativity, innovation, and initiative to make the participants inquisitive, bringing good engineering practices and lessons learned to the field, that benefits their professional lives in the long term.**

Our Company

Arveng Training & Engineering SL is a leading company providing Training and Engineering services based in **Madrid, Spain.** Our mission and vision are to be a leading training and engineering services company, providing our clients with the best in the sector. We are a team of highly motivated, talented, highly qualified professionals with over 20 years of experience. We aim to exceed expectations by offering efficient, innovative, cost-effective, and transparent services.

Established in July 2010, mainly oriented to the industrial sector, from the very beginning Arveng has always worked with closeness, responsibility, and commitment in all areas of activity.

Through experience gained by partaking in multidisciplinary engineering projects in sectors such as Petrochemical, Energy Generation, and Industrial, we provide answers and solutions to concrete requirements, making the effort to build long-lasting and mutually beneficial relationships.