ENGINEERING TRAINER

Introduction to Pipe Stress Engineering: Fundamentals 2

This second pipe-stress fundamentals course covers flexibility under ASME B31.3, load combinations, components, supports, flange leakage, special cases and technical reporting. It extends the first course's foundation into the calculations and decisions used in a basic pipe-stress workflow. This self-paced online course includes video lectures, knowledge-check quizzes and a completion certificate with PDH credits.

Buy This Course

Request a Quote or Invoice

ONLINE	SELF-PACED	1-YEAR ACCESS
6 MODULES	7.5 PDH	7.5 HOURS

TRUSTED BY ENGINEERING TEAMS WORLDWIDE

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What you'll learn

This course by Stressman Engineering gives you a strong base and understanding of Pipe Stress Engineering. It will enhance your discussions with colleagues, vendors, and clients and refuels you with inspiration and knowledge. In a set of online courses, you learn to understand the design philosophy of pipe stress. With practical examples, the instructors will provide you with a prominent course and give you a complete overview.

The course provides a broad context of the concepts, insights into possibilities for optimization and cost reduction, and a strong base for deeper discussions with colleagues, vendors, and clients.

This Fundamentals course contains 6 online courses based on video content.

Skills you'll gain

- ✓ Know all concepts involved in a pipe stress flexibility analysis,
- ✓ Better understand code related load combinations,
- ✓ Have a good overview of all types of piping components and support types,
- ✓ Know about different flange types and calculations,
- ✓ Understand special load cases for piping systems,
- ✓ Have a detailed understanding of the documentation aspects involved with pipe stress and interfaces with other disciplines.

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About the instructor

Stressman Engineering

Stressman Engineering specializes in stress analysis, from hand calculations to three-dimensional finite element analysis. Its pipe-stress courses explain piping loads, code checks, equipment interfaces, support choices and technical reporting through practical engineering examples.

Who this course is for

- ✓ Piping design engineers who need a deeper understanding of flexibility and code checks
- ✓ Piping design leads responsible for piping-system decisions
- ✓ Junior pipe stress engineers who have completed the Fundamentals 1 scope
- ✓ Mechanical engineers who need a broader view of pipe stress engineering
- ✓ Process engineers who need to understand piping loads and equipment interfaces
- ✓ Structural engineers who interface with pipe supports and piping loads

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Course content

Module 1 - Flexibility Calculation as per B31.3

- Module Introduction & Overview
- Basic Allowable Stress Tables
- Allowable Stress due to Sustained Loads
- Allowable Stress due to Displacement Strains
- Occasional Stress Allowable
- Pipe Weight Considerations
- Fluid Weight Considerations
- Additional Weight: Insulation & Internal Lining
- The buoyancy of Piping Systems
- Elasticity Modules Tables
- Flexibility Factors & Stress Intensification Factors (SIF)
- Pressure Stiffening of Components
- Pressure & Weight Sustained Stresses
- Pipe Span Calculations
- Thermal Expansion Coefficient Tables
- Displacement Stress
- Expansion Loops
- Sagging & Hogging
- Drag loads
- Wind Loading on Piping Systems
- Acceleration on Piping Systems
- Transportation Analysis of Piping Systems

Module 2 - Load Combination Cases for Pipe Stress Analysis

- Exercise Review
- Load Combination Cases Part A
- Basic Load Combinations Part B
- Load Combinations Example Part C
- Load Case Combinations Part D
- Load Case Combinations Part E
- Load Case Combinations Part G
- Scalar Combinations of Loads
- Non-linearities
- Load Combinations Example for Pipe Stress Analysis
- Accidental Loads

Module 3 - Piping Component and Support

- Trunnions and welded attachments
- Cryogenic supports
- High temperature supports
- Anti-vibration supports
- Expansion Joints
- Spring supports
- Struts
- Snubbers

Module 4 - Flange Leakage Calculations

- Introduction & Recap
- Flange Leakage Calculations
- Kellogg's equivalent pressure method
- Flange calculation: ASME VIII Division 1 & 2
- Flange calculation: API TR 6AF & API TR 6AF2

Module 5 - Piping Stress Special Cases

- Category M Fluid Piping as per ASME B31. 3
- High-Pressure Piping
- Piping supports settlement
- Equipment settlements
- Pipeline / Soil settlements
- Slug flow
- Water Hammer or Surge
- Discharge in open systems: Pressure Safety valves
- Discharge in closed systems: Pressure Safety valves
- Acoustic induced vibration (AIV)
- Flow-induced vibrations (FIV)
- Summary AIV vs. FIV
- Vortex-Induced Vibrations
- Pulsations in Piping Systems (Flow-induced pulsations)
- Thermal Bowing
- Hydrogen Induced Stress Cracking (HISC)
- Jacketed Piping
- Blast Calculations
- Recap & Exercise Review

Module 6 - Reporting a Pipe Stress Analysis

- Introduction & Overview
- Reporting a Pipe Stress Analysis
- Report Build-up
- Stress Isometrics
- Audit Documentation
- Piping Stress Checklist