



KASA Redberg

Engineers & Technical Trainers

Proudly presents

Pressure Vessel Design to AS1210

A practical and interactive two day seminar

Pressure Vessel Design to AS1210

Introduction

The design of pressure vessels is a specialist task that requires a thorough understanding of topics such as: “strength of materials”; stress analysis and relevant design codes. Pressure vessel design also necessitates a logical, planned approach to the documentation of all relevant calculations as in many cases, these design calculations can be quite extensive.

AS1210 Pressure Vessels is the governing standard in Australia relating to pressure vessel design. It is therefore appropriate that Australian engineers should be provided with an opportunity to formally receive instruction in the area of pressure vessel design in the context of the relevant Australian standard.

The purpose of this two-day seminar is to provide a thorough understanding of the fundamental design principles of pressure vessels as well as instruction in the most commonly employed clauses of AS1210. Attendees also gain a brief insight into the differences between AS1210 and ASME BPVC Section VIII Div. 1.

Who Should Attend

Consulting Engineers, Process Engineers, Design Engineers, Project Engineers, and anyone who needs to design, inspect or sell pressure vessels compliant with AS1210 as part of their job function. This seminar is ideally suited to Junior/Graduate Engineers or those new to the area of pressure vessel design or migrant engineers who have no experience with AS1210.

Delegate Pre-Requisites

As this seminar includes numerous design calculations, it is recommended that each attendee is degree or diploma qualified in a relevant technical discipline (e.g. mechanical, chemical or structural engineering).

As this seminar guides the attendee from relevant “strength of materials” theory and stress calculations all the way through to AS1210 specific clauses, no previous knowledge or exposure to pressure vessel design is required. However, it would be extremely beneficial for the attendee to have seen some examples of pressure vessels at their place of work prior to attending so that some “context” can be provided to better aid the learning process.

Seminar Objectives

At the completion of this seminar, each attendee should be able to:

- Thoroughly understand how “strength of materials” theory forms the basis of all international pressure vessel codes and standards.
- Understand the most commonly used terms and jargon within the area of pressure vessel design.
- Appreciate the attention to detail required in designing the various components and parts that make-up a pressure vessel (e.g. head types, supports, connections, shells etc).
- Understand how pressure vessels fail.
- Recognise and compare the different methods of stress analysis available for pressure vessel design purposes.
- Design industry standard types of pressure vessels so that compliance with AS1210 is achieved with a minimal amount of supervision and/or guidance from a Senior/Supervising Engineer.
- Appreciate the intent and instruction contained within the most commonly employed clauses of AS1210.
- Understand some basic differences between AS1210 and ASME BPVC Section VIII Div. 1.
- Have a basic understanding of topics relating to: vessel manufacturing methods; vessel testing, marking and qualification; and pressure relief devices.

Training Seminar Materials

All delegates receive:

- A Detailed Seminar Manual** – Which provides a reference text of all of the material presented during the seminar. Note: This manual is written as a textbook which allows it to be more useful as a future design reference.
- Certificate of Attendance** – Which states the number of hours of training and serves as documentary proof of attendance.

Note: Copies of the most recent edition of *AS1210 Pressure Vessels* shall be made available to each attendee during the seminar. These copies shall be returned to KASA at the completion of the seminar. Alternatively, attendees can bring their own copy if more convenient.





Seminar Synopsis

DAY 1

BACKGROUND INFORMATION

- Industry terms and jargon defined.
- Examples of pressure vessel failures.
- Tensile tests and stress-strain diagrams.
- Stresses: Primary, secondary, peak and allowable.
- Failure theories.
- Thin walled versus thick-walled pressure vessels.
- Roark's, Shigley's and Timoshenko's formulas versus finite element (FEA) methods.
- Background information to AS1210.
- Vessel classes.
- AS1210 "Walk-through".
- Worked example problems.

LAYOUT

- Pressure vessel parts and components: Shell, head, legs, skirt, internals etc.
- Pressure Vessel Orientation.
- Examples of industry standard pressure vessels for various selected applications.
- Worked example problems.

AS1210 GUIDANCE - MATERIALS

- Materials selection and specification.
- Commonly used materials and their applications.
- Material identification.
- Materials testing.
- Corrosion allowances.

AS1210 GUIDANCE – LOADS, SHELLS & JOINTS

- Design pressure, temperature, load factors and combined loadings.
- Joint design – welded, brazed, soldered etc.
- Basic shell design – internal pressure only.
- Advanced shell design – pressure and combined loadings.
- Worked example problems.

DAY 2

AS1210 GUIDANCE – LOADS, SHELLS & JOINTS CONTINUED

- Advanced shell design - pressure and combined loadings.
- Advanced shell design – stiffening rings.
- End design – thickness, shape, attachment.
- Design of doors, stays and manholes etc.
- Worked example problems.

AS1210 GUIDANCE – OPENINGS, CONNECTIONS, BRANCHES & SUPPORTS

- Design of openings – un-reinforced and reinforced.
- Design of connections and branches.
- Design of vessel supports.
- Worked example problems.

AS1210 GUIDANCE - ANCILLARIES

- Level gauges.
- Arrestors.
- Relief valves.

AS1210 GUIDANCE – MANUFACTURING

- Pressure vessel fabrication.
- Pressure vessel inspection.
- Testing and documentation.

ASME BPVC Section VIII Div. 1 COMPARISON

- ASME pressure vessel code history and structure.
- A brief summary of design rules and equations.
- A brief comparison between ASME BPVC Section VIII Div. 1 and AS1210.
- A basic worked example problem to ASME BPV Section VIII Div. 1.