

English Version

Unfired pressure vessels - Example of application

Réipients sous pression non soumis à la flamme - Partie
101 : Exemple d'application

Unbefeuerte Druckbehälter - Teil 101: Anwendungsbeispiel

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Foreword

This document (CEN/TR 13445-101:2015) has been prepared by Technical Committee CEN/TC 54 “Unfired pressure vessels”, the secretariat of which is held by BSI.

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1 Scope

This Technical Report presents an application of EN 13445 through an example of design and fabrication of an unfired pressure vessel. Every step is described as far as possible:

- Material choice;
- Design and calculation;
- Fabrication;
- Inspection and testing;

using the following part of EN 13445:

- EN 13445-1:2009;
- EN 13445-2:2009;
- EN 13445-3:2009;
- EN 13445-4:2009;
- EN 13445-5:2009 .

As applicable, some choices for design or fabrication are made according to “the state of art” practice.

Some parts of EN 13445 are reproduced in order to show which requirements are relevant to the design and fabrication of the target vessel.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 287-1:2004+A2:2006, *Approval testing of welders — Fusion welding — Part 1: Steels*

EN 473:2008, *Non-destructive testing — Qualification and certification of NDT personnel — General principles*

EN 764-5:2002, *Pressure Equipment — Part 5: Compliance and Inspection Documentation of Materials*

EN 1092-1:2007, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated*

EN 1418:1997, *Welding personnel — Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanized and automatic welding of metallic materials*

EN 1515-3:2005, *Flanges and their joints — Bolting — Part 3: Classification of bolt materials for steel flanges, class designated*

EN 1515-4:2009, *Flanges and their joints — Bolting — Part 4: Selection of bolting for equipment subject to the Pressure Equipment Directive 97/23/EC*

EN 1759-1:2004, *Flanges and their joint — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 1: Steel flanges, NPS 1/2 to 24*

EN 10025-2:2004, *Hot rolled products of structural steels — Part 2: Technical delivery conditions for non-alloy structural steels*

EN 10028-1:2007, *Flat products made of steels for pressure purposes — Part 1: General requirements*

EN 10028-2:2003, *Flat products made of steels for pressure purposes — Part 2: Non-alloy and alloy steels with specified elevated temperature properties.*

EN 10029:2010, *Hot-rolled steel plates 3 mm thick or above — Tolerances on dimensions and shape*

EN 10204:2004, *Metallic products — Types of inspection documents.*

EN 10216-3:2002, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 3: Alloy fine grain steel tubes*

EN 10222-4:1998, *Steel forgings for pressure purposes — Part 4: Weldable fine grain steels with high proof strength.*

EN 10269:1999+A1:2006, *Steels and nickel alloys for fasteners with specified elevated and/or low temperature properties*

EN 12560-4:2001, *Flanges and their joints — Gaskets for Class-designated flanges — Part 4: Corrugated, flat or grooved metallic and filled metallic gaskets for use with steel flanges*

CR ISO 15608:2000, *Welding — Guidelines for a metallic material grouping system (ISO/TR 15608:2000)*

EN ISO 15614-1:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1:2004)*

3 Presentation of example

3.1 General

The target vessel consists of several components:

- a cylindrical shell,
- two elliptical ends,
- a welding neck flange,
- a nozzle,
- two saddle supports arranged symmetrically

3.2 Pressure vessel data

The data specified for the present example are the following:

- Vessel data: