

**Flanges and their joints - Part 4: Qualification of
personnel competency in the assembly of the bolted
connections of critical service pressurized systems**

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 1591-4:2013 sisaldab Euroopa standardi EN 1591-4:2013 ingliskeelset teksti.	This Estonian standard EVS-EN 1591-4:2013 consists of the English text of the European standard EN 1591-4:2013.
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English Version

**Flanges and their joints - Part 4: Qualification of personnel
competency in the assembly of the bolted connections of critical
service pressurized systems**

Brides et leurs assemblages - Partie 4: Qualification des
compétences du personnel en charge du montage des
assemblages boulonnés sur des systèmes sous pression
en service critique

Flansche und ihre Verbindungen - Teil 4: Qualifizierung der
Befähigung von Personal zur Montage von
Schraubverbindungen in druckbeaufschlagten Systemen im
kritischen Einsatz

This European Standard was approved by CEN on 22 June 2013.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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Foreword

This document (EN 1591-4:2013) has been prepared by Technical Committee CEN/TC 74 “Flanges and their joints”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2014, and conflicting national standards shall be withdrawn at the latest by February 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN/TS 1591-4:2007.

The detailed changes that have been made in converting CEN/TS 1591-4: 2007, a guidance document, to EN 1591-4: 2013, a European Standard containing requirements to be met, are too numerous to describe in detail. It is recommended that users of CEN/TS 1591-4:2007 study EN 1591-4:2013 in full in order to understand the differences between the two documents.

EN 1591, *Flanges and their joints*, consists of the following parts:

- EN 1591-1, *Flanges and their joints — Design rules for gasketed circular flange connections — Part 1: Calculation method*
- EN 1591-2, *Flanges and their joints — Design rules for gasketed circular flange connections — Part 2: Gasket parameters*
- CEN/TS 1591-3, *Flanges and their joints — Design rules for gasketed circular flange connections — Part 3: Calculation method for metal to metal contact type flanged joint*
- EN 1591-4, *Flanges and their joints — Part 4: Qualification of personnel competency in the assembly of the bolted connections of critical service pressurized systems* (the present document)
- CEN/TR 1591-5, *Flanges and their joints — Design rules for gasketed circular flange connections — Part 5: Calculation method for full face gasketed joints*

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The competence of the bolting technicians is a key factor in the safe operation of a system containing pressurised bolted connections and in the achievement of the highest performance from a pressurised bolted connection. Design codes for pressurised bolted connections such as EN 1591-1 require controlled bolt tightening. Therefore, competent bolting technicians are needed so that the specified bolt load tolerances can be met and, where appropriate, the specified tightness requirement can be achieved.

Training and competence, experience and knowledge are often confused with each other. Training is no guarantor of competence, nor is experience a guarantor of knowledge and understanding. Training, experience, and assessment of the ability to apply knowledge are all required to achieve competence.

The essential elements needed to achieve competency are:

- a) theoretical knowledge combined with practical experience gained on site or by simulated workshop activities;
- b) assessment by a competent assessor to verify that the required knowledge, skill and ability has been gained and can be applied in accordance with an operating procedure.

These elements may be achieved through formal education and training, or experiential, work-based learning, or a combination of the two. Nevertheless, competency can only be demonstrated by the method indicated in this document. It sets out the training syllabi for not only the bolting technicians, who actually disassemble, assemble and tighten bolted joints that in service will be pressurised, but also the syllabi for the personnel who supervise those technicians, the responsible engineers.

Competency in the analysis of pressurised bolted connection failures is not required beyond use of knowledge gained during training.

A correctly assembled and tightened pressurised bolted connection that fails in service requires specialist knowledge to understand why the failure occurred and is outside the scope of this European Standard.

1 Scope

This European Standard is applicable to the bolting technicians, and their supervisors, the responsible engineers, who disassemble, assemble and tighten the bolted connections of whatever shape of critical service pressurised systems. A failure of a connection in such a system would endanger personnel, plant or the environment. A route for achieving competency in the skills required to safely and successfully disassemble, assemble and tighten pressurised bolted joints of any shape to a design bolt load using documented work instructions is given in this document. The aim is the establishment of a joint capable of maintaining a leak-free status throughout its' service life.

This European Standard provides a modular training syllabus and an assessment process that can be used to determine the competency of personnel who disassemble, assemble and tighten bolted connections, whatever their shape, fitted to pressurised equipment containing a medium at any combination of temperature and pressure.

Bolting technicians have to assemble bolted connections of different levels of complexity. For this reason, training matrices dealing with bolted connections of various levels of complexity and for different types of pressurised bolted connections are given in this document. The modular structure created allows a bolting technician, once competency in the foundation level has been achieved, to obtain competency in higher levels as required.

Certification to this European Standard provides an attestation of general competency in accordance with the stated syllabi and assessments.

Certification to this European Standard does not represent an authorisation to operate, since this remains the responsibility of the employer, and the certified person may require additional specialised knowledge of employer-specific procedures, processes and equipment.

2 Normative references

Not applicable.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

manufacturer

organisation that manufactures the device having the bolted connection

3.2

operator

organisation that is, or will be, responsible for the operation and maintenance of equipment

Note 1 to entry: This includes suppliers or contractors employed to disassemble, assemble and tighten bolted connections on pressurised equipment.

3.3

constructor

organisation that is or will be responsible for the construction and/or commissioning of a plant containing pipework and equipment

Note 1 to entry: This includes suppliers and contractors employed to disassemble, assemble and tighten bolted gasketed connections on pressurised equipment.