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Metal bellows expansion joints for pressure applications

Táto norma obsahuje anglickú verziu európskej normy.  
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## Metal bellows expansion joints for pressure applications

Compensateurs de dilatation à soufflets métalliques  
pour appareils à pressionKompensatoren mit metallischen Bälgen für  
Druckanwendungen

This European Standard was approved by CEN on 21 June 2021.

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## European foreword

This document (EN 14917:2021) has been prepared by Technical Committee CEN/TC 342 “Metal hoses, hose assemblies, bellows and expansion joints”, the secretariat of which is held by SNV.

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of an identical text or by endorsement, at the latest by January 2022, and conflicting national standards shall be withdrawn at the latest by January 2022.

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

This document supersedes EN 14917:2009+A1:2012.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

Modifications to EN 14917:2009+A1:2012:

- adaptation to Directive 2014/68/EU;
- general revision and correction;
- complete revision and restructuring of Clause 6, i.a.;
  - addition of design in the creep range;
  - modification of stress calculation for internal pressure capability;
  - reformulation of column instability calculation;
  - modification of in-plane instability calculation;
  - harmonisation of fatigue calculation for all bellows types and introduction of 4 fatigue curves for different material classes;
  - extension of material characteristics for calculating forces and moments on pressurised expansion joints;
- addition of Annex K for stress calculation of hardware;
- revision of Testing, inspection and documentation;
- revision of material properties in Annex B and Annex J;
- correction of Coefficient  $C_p$ .

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.



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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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## **Introduction**

Metal bellows expansion joints are used as parts in pressure vessels or piping components.

If an expansion joint is designed and manufactured covered by EU-Directive 2014/68/EU a risk assessment has to be done. The possible risks of an expansion joint and how they have been dealt in this document are described in Annex I.

**EN 14917:2021 (E)****1 Scope**

This document specifies the requirements for design, manufacture and installation of metal bellows expansion joints with circular cross section for pressure applications with maximum allowable pressure greater than 0,5 bar.

**2 Normative references**

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

EN 764-4:2014, *Pressure equipment — Part 4: Establishment of technical delivery conditions for metallic materials*

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EN 10216-5:2013, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 5: Stainless steel tubes*

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EN 10217-2:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 2: Electric welded non-alloy and alloy steel tubes with specified elevated temperature properties*

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EN 10217-4:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 4: Electric welded non-alloy steel tubes with specified low temperature properties*

EN 10217-5:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 5: Submerged arc welded non-alloy and alloy steel tubes with specified elevated temperature properties*

EN 10217-6:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 6: Submerged arc welded non-alloy steel tubes with specified low temperature properties*

EN 10217-7:2014, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 7: Stainless steel tubes*

EN 10222-2:2017, *Steel forgings for pressure purposes — Part 2: Ferritic and martensitic steels with specified elevated temperatures properties*

EN 10222-3:2017, *Steel forgings for pressure purposes — Part 3: Nickel steels with specified low temperature properties*

EN 10222-4:2017, *Steel forgings for pressure purposes — Part 4: Weldable fine grain steels with high proof strength*

EN 10222-5:2017, *Steel forgings for pressure purposes — Part 5: Martensitic, austenitic and austenitic-ferritic stainless steels*

EN 10253-2:2007, *Butt-welding pipe fittings — Part 2: Non alloy and ferritic alloy steels with specific inspection requirements*

EN 10253-3:2008, *Butt-welding pipe fittings — Part 3: Wrought austenitic and austenitic-ferritic (duplex) stainless steels without specific inspection requirements*

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- EN ISO 15609-5:2011, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 5: Resistance welding (ISO 15609-5:2011, Corrected version 2011-12-01)*
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- EN ISO 15614-1:2017,<sup>1</sup> *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 15614-1:2017, Corrected version 2017-10-01)*
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<sup>1</sup> As impacted by EN ISO 15614-1:2017/A1:2019.

**EN 14917:2021 (E)**

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