



SLOVENSKI STANDARD

SIST EN 14585-1:2006

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Valoviti kovinski cevni sestavi za uporabo v tlačnih cevovodih – 1. del: Zahteve

Corrugated metal hose assemblies for pressure applications - Part 1: Requirements

Gewellte Metallschlauchleitungen für Druckanwendungen - Teil 1: Anforderungen

Tuyauteries métalliques flexibles onduleuses pour applications sous pression - Partie 1 :
Prescriptions

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Ta slovenski standard je istoveten z: **EN 14585-1:2006**

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ICS:

77.140.75	Jeklene cevi in cevni profili za posebne namene	Steel pipes and tubes for specific use
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EUROPEAN STANDARD
NORME EUROPÉENNE
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Corrugated metal hose assemblies for pressure applications - Part 1: Requirements

Tuyauteries métalliques flexibles onduleuses pour
applications sous pression - Partie 1 : Prescriptions

Gewellte Metallschlauchleitungen für Druckerwendungen -
Teil 1: Anforderungen

This European Standard was approved by CEN on 21 November 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This European Standard (EN 14585-1:2006) has been prepared by Technical Committee CEN/TC 342 “Metal hoses, hose assemblies, bellows and expansion joints”, the secretariat of which is held by UNI.

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 July 2006, and conflicting national standards shall be withdrawn at the latest by July 2006.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) 97/23/EC [1].

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

This standard provides one means of conforming to the related essential requirements.

This standard has been produced to address the specific needs of corrugated metal hose assemblies for pressure applications using, and when necessary supplementing, the requirements of EN ISO 10380 “Pipework – Corrugated metal hoses and hose assemblies” which is the base standard for hoses and hose assemblies for general purposes.

This standard consists of 2 parts:

- EN 14585-1 “Corrugated metal hose assemblies for pressure applications – Part 1 – Requirements”;
- prCEN/TR 14585-2 “Corrugated metal hose assemblies for pressure applications – Part 2 – Guidance for the use of conformity assessment procedures”.

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

Introduction

The requirements of this standard concern designers, manufacturers, suppliers and importers of corrugated metal hose assemblies for pressure application.

The unique nature of a corrugated metal hose assembly is characterised:

- by the interactive role of its pressure bearing parts: corrugated metal hose, braid, fittings and its permanent joints;
- and by the opposing requirements of pressure resistance and flexibility.

PED, Annex I, Clause 2.2.2 as a general rule limits the experimental design method for piping to PS·DN less than 3000. For the time being there is no officially recognised calculation method available to design hose assemblies. Accordingly it is essential that validation tests support design for all values of PS·DN.

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1 Scope

This European Standard specifies the requirements for material, design, manufacturing, testing and documentation for corrugated metal hose assemblies for pressure applications for use with a maximum allowable pressure PS greater than 0,5 bar.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. 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, *Qualification test of welders - Fusion welding - Part 1: Steels*

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

EN 1593, *Non destructive testing – Leak testing – Bubble emission techniques*

EN 1779, *Non destructive testing – Leak testing – Criteria for method and technique selection*

prEN 10028-7, *Flat products made of steels for pressure purposes - Part 7: Stainless steels*

EN 10045-1, *Metallic materials - Charpy impact test - Part 1: Test method*

EN 10088-1, *Stainless steels - Part 1: List of stainless steels*

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

EN 13133, *Brazing - Brazer approval*

EN 13134, *Brazing - Procedure approval*

EN 13480-2, *Metallic industrial piping – Part 2: Materials*

EN ISO 7369:2004, *Pipework - Metal hoses and hose assemblies - Vocabulary (ISO 7369:2004)*

EN ISO 9606-4, *Approval testing of welders - Fusion welding - Part 4: Nickel and nickel alloys (ISO 9606-4:1999)*

EN ISO 10380:2003, *Pipework - Corrugated metal hoses and hose assemblies (ISO 10380:2003)*

EN ISO 15614-1, *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 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 7369:2004 and the following apply.

3.1

metal hose assembly

assembly of a corrugated metal hose with its end fittings

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NOTE In the context of Pressure Equipment Directive (PED), a metal hose assembly is a component of piping and not a PED assembly.

3.2**pressure hose assembly**

corrugated metal hose assembly for pressure PS greater than 0,5 bar

3.3**SEP pressure hose assembly**

pressure hose assembly related to Pressure Equipment Directive 97/23/EC, Article 3, Paragraph 3

3.4**CAT pressure hose assembly**

pressure hose assembly related to Categories in Pressure Equipment Directive 97/23/EC

3.5**PS**

maximum allowable pressure at maximum allowable temperature for which the pressure hose assembly is designed, as specified by the manufacturer

3.6**TS**

minimum/maximum temperatures for which the pressure hose assembly is designed, as specified by the manufacturer

3.7**parts**

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3.7.1**main pressure bearing parts**

parts, such as corrugated metal hose, braid, tube end, the failure of which may result in a sudden discharge of pressure energy

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3.7.2**pressure bearing parts other than main pressure bearing parts**

parts, such as swivel nuts, flanges, threaded fittings, the failure of which may not lead to a sudden discharge of pressure energy

3.7.3**attachments to main pressure bearing parts and to pressure parts**

parts, such as ferrules, that are directly welded to parts defined in 3.7.1 or 3.7.2

3.7.4**other parts**

parts, such as safety lines, external protections, that are not parts according to 3.7.1, 3.7.2 or 3.7.3

3.8**experimental tests**

tests made to develop an experimental design method

3.9**validation tests**

tests made to validate a calculation design method

3.10**category**

grouping according to the Pressure Equipment Directive 97/23/EC

NOTE For categories definitions, see also prCEN/TR 14585-2.

3.11

temperature derating factor

coefficient relating the maximum allowable pressure load at temperature compared to the maximum allowable load at ambient

4 Classification

Pressure hose assemblies are classified by the manufacturer using diagrams (see Figures A.1, A.2, A.3 and A.4) into SEP pressure hose assemblies or CAT pressure hose assemblies that lead in the following clauses to different requirements and evaluation procedures. Their classification depends on DN and PS and on the type of fluid they contain according to Table 1.

When a pressure hose assembly has different DN's along its length, the classification shall be determined by the largest DN section of the pressure hose assembly.

Where a pressure hose assembly can be subjected to different working conditions, the classification shall be made on the basis of the more severe working conditions.

Where a pressure hose assembly can contain several fluids, the classification shall be made on the basis of the fluid of the highest category.

Table 1 — Classification of the pressure hose assemblies

Fluid	Dangerous fluids in Group 1 (explosive, extremely flammable, highly flammable, flammable - where the maximum allowable temperature is above flashpoint - very toxic, toxic and oxidizing)	Other fluids in Group 2
Gases, liquefied gases, gases dissolved under pressure, vapours and liquids with a vapour pressure at maximum allowable pressure greater than 0,5 bar above normal atmospheric pressure (1013 mbar)	Fluids in Group 1 with a DN greater than 25 (see also Figure A.1)	Fluids in Group 2 with a DN greater than 32 and a product of PS and DN greater than 1000 bar (see also Figure A.2)
Liquids having a vapour pressure at maximum allowable temperature (TS) of more than 0.5 bar above normal atmospheric pressure (1013 mbar)	Fluids in Group 1 with a DN greater than 25 and a product of PS and DN greater than 2000 bar (see also Figure A.3)	Fluids in Group 2 with a PS greater than 10 bar, a DN greater than 200 and a product of PS and DN greater than 5000 bar (see also Figure A.4)

CAT pressure hose assemblies are also sub-classified into categories (I, II and III) depending on DN and PS and on the type of fluid they contain, see prCEN/TR 14585-2.

NOTE 1 The demarcation lines in the Figures A.1 to A.4 defining the limits between the SEP and CAT pressure hose assemblies belong to the SEP pressure hose assembly.

NOTE 2 National regulations transposing the Council Directive 67/548/EC [2] of 27 June 1967 on classification of dangerous substances should be considered. In case of doubt regarding the group to which a fluid belongs, the manufacturer should obtain the information from the user.

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NOTE 3 Particular care should be taken with unstable gases such as acetylene, methyl acetylene, vinylfluoride etc.

5 SEP pressure hose assemblies

The requirements for materials, design, manufacturing, pressure test, leak test, marking and operating instructions for SEP pressure hose assemblies shall be in accordance with EN ISO 10380.

6 CAT pressure hose assemblies**6.1 Materials****6.1.1 Materials requirements**

6.1.1.1 The materials used for corrugated metal hose, braid, ferrules and fittings shall be selected on the basis of their suitability for fabrication and intended use and shall conform to a harmonized standard or comply with a European Approval of Material (EAM) or have a Particular Material Appraisal (PMA).

NOTE The PED requires that for a Category III pressure hose assembly PMA be performed by a notified body.

6.1.1.2 Low temperature requirement

- a) Suitable materials for corrugated metal hoses, braids and ferrules for low temperature applications listed in Table 2 shall be used.

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Table 2 — Materials to be used at low temperature for corrugated metal hoses, braids and ferrules

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Materials					
Standard for corrugated metal hose material	Number	Minimum allowable temperature according to EN 13480-2	Standard for braid and ferrule material	Number	Minimum allowable temperature according to EN 13480-2
prEN 10028-7	1.4306	- 270 °C	EN 10088-1:	1.4306	- 270 °C
	1.4435	- 270 °C		1.4435	- 270 °C
	1.4401	- 196 °C		1.4301	- 196 °C
	1.4404	- 196 °C		1.4401	- 196 °C
	1.4541	- 196 °C		1.4404	- 196 °C
	1.4571	- 196 °C		1.4541	- 196 °C
					1.4571

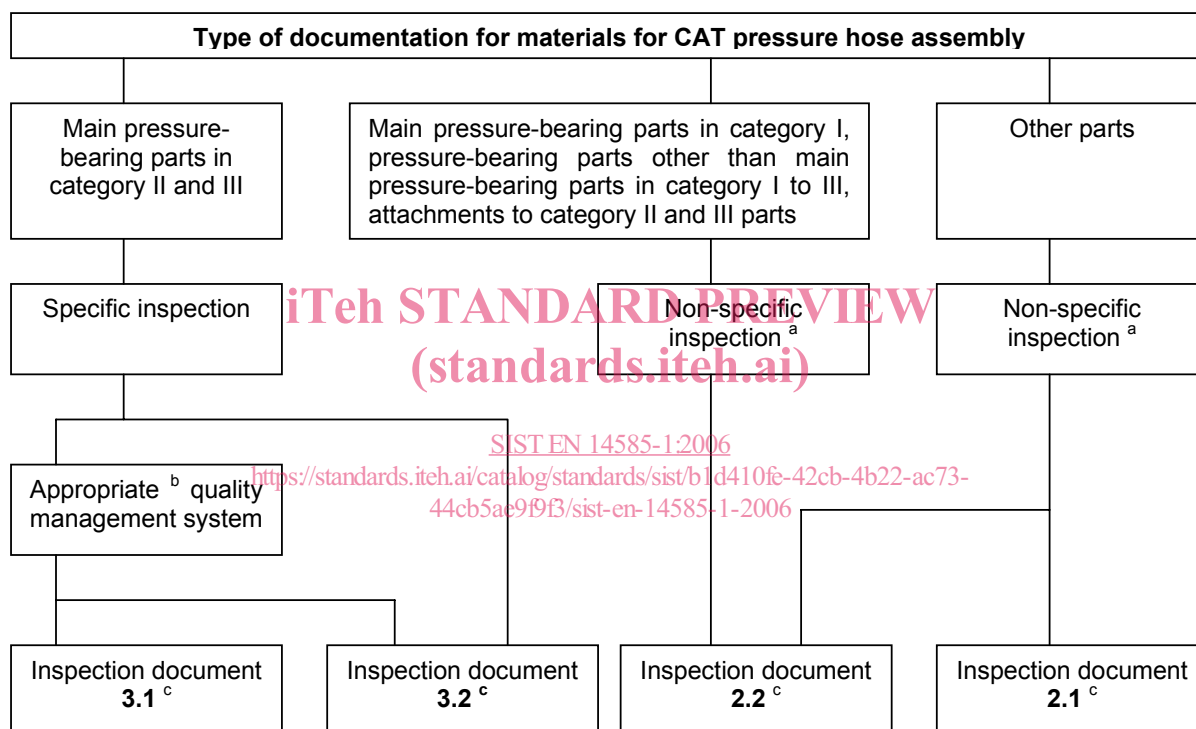
- b) For fittings suitable low temperature materials shall be used. In addition, for temperature below TS – 20 °C, fittings made of austenitic stainless steel with thickness greater than 20 mm or of ferritic steel and other materials with a thickness greater than 5 mm shall pass a Charpy V-notch test according to EN 10045-1. The materials used for fittings shall pass the impact test with an impact energy of at least 40 J for austenitic stainless steel and at least 27 J for carbon steel.

6.1.1.3 When choosing materials including joining consumables due care shall be taken regarding:

- compatibility with each other;
- resistance against corrosion caused by the transported fluid;
- resistance against corrosion caused by the environment;
- degrading of the corrosion resistance due to the forming and welding processes.

6.1.2 Material documentation

The manufacturer shall obtain from the material suppliers the documentation defined in Figure 1.



^a Non specific inspection may be replaced by specific inspection if specified in the material standard or the order.

^b Quality management system of the material manufacturer certified by a competent body established within the Community and having undergone a specific assessment for materials.

^c In accordance with EN 10204.

Figure 1 — Material documentation

For welding and brazing consumables a test report according to EN 10204:2004 – type 2.2 shall be the minimum requirement for all categories.