
Upogljivi valoviti cevni sistemi iz nerjavnega jekla za plin v stavbah z delovnim tlakom do 0,5 bara

Stainless steel pliable corrugated tubing systems in buildings for gas with an operating pressure up to 0,5 bar

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ICS

English version

Stainless steel pliable corrugated tubing systems in buildings for gas with an operating pressure up to 0,5 bar

Systèmes de tuyaux onduleux pliables en acier inoxydable
pour le gaz dans les bâtiments avec une pression de
service inférieure ou égale à 0,5 bar

Nichtrostende biegbare Wellrohrsysteme in Gebäuden für
Gas mit einem Arbeitsdruck bis 0,5 bar

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 342.

If this draft becomes a European Standard, 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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (prEN 15266:2005) 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 document is currently submitted to the CEN Enquiry.

This document 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 89/106/EC [1].

For relationship with EU Directive 89/106/EC, see informative Annex ZA, which is an integral part of this document.

NOTE For applications above 0,5 bar working pressure, in addition to this standard, reference should be made to the Directive 97/23/EC (PED). [2].

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Introduction

This European standard contains the general safety requirements relating to the safety of persons, animals, and property and the protection of their environment.

The requirements of this standard concern designers, manufacturers, suppliers, importers and installers of stainless steel pliable corrugated gas tubing systems for buildings.

This European standard has been produced to address the specific needs of stainless steel pliable corrugated gas tubing systems for buildings.

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1 Scope

This European standard specifies the requirements for material, design, manufacture, testing, marking and documentation of stainless steel pliable corrugated gas tubing design systems for buildings and for maximum operating pressure $\leq 0,5$ bar, with a nominal size range from DN 10 to DN 50.

This document applies to new installations as well as to replacement of, or extensions to, or modifications to existing systems for 1st, 2nd and 3rd family gases. Stainless steel corrugated gas tubing systems may be used in conjunction with other approved gas piping systems.

Note The definitions of 1st, 2nd and 3rd family gases are given in EN 437:2003.

This document does not apply to:

- pliable corrugated tubing without cover;
- corrugated safety metal hose assemblies for connection to moveable appliances

This document does not cover the installation aspects of stainless steel pliable corrugated gas tubing systems which could be subject to local and/or National Regulation involving mandatory strength and tightness pressure tests before commissioning.

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 437:2003, *Tests gases - Test pressures – Appliances categories*.

prEN 1775:2004, *Gas supply - Gas pipework for buildings - Maximum operating pressure inferior or equal to 5 bar - Functional recommendations*.

EN ISO 7369:2004, *Pipework - Metal hoses and hose assemblies – Vocabulary*.

EN 10028-7:2000, *Flat products made of steels for pressure purposes – Part 7: Stainless steels*.

EN 10088-1:1995, *Stainless steels - Part 1: List of stainless steels*.

EN 10088-3: 1995, *Stainless steels- Part 3: Technical delivery conditions for semi-finished products, bars, rods and sections for general purposes*.

EN 10226-1:1996, *Pipe threads where pressure tight joints are made on the threads - Part 1: Designation, dimensions and tolerances*.

EN 10242:1994, *Threaded pipe fitting in malleable cast iron*.

EN ISO 9001:2000, *Quality management systems – Requirements*,

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

EN ISO 11925-2:2002, *Reaction to fire tests - Ignitability of building products subjected to direct impingement of flame - Part 2: Single-flame source test*.

EN 12164:1998, *Copper and copper alloys – Rod for free machining purposes*.

EN 12165:1998, *Copper and copper alloys – Wrought and unwrought forging stock.*

EN 13501-1:2002, *Fire classification of construction products and building elements - Part 1: Classification using test data from reaction to fire tests.*

EN 13823:2002, *Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item.*

EN ISO 6509:1995, *Corrosion of metals and alloys – Determination of dezincification resistance of brass.*

ISO 6957:1988, *Copper alloys - Ammonia test for stress corrosion resistance.*

ISO 9227:1990, *Corrosion tests in artificial atmospheres - Salt spray tests.*

3 Terms and definitions

For the purpose of this European standard, the definitions listed in EN ISO 7369:2004, prEN 1775 and the following terms and definitions apply:

3.1

buildings

see prEN 1775

3.2

PLT system

fixed installation assembled on site using a combination of compatible elements (including at least pliable corrugated tubing, mechanical fittings and supports), obtained or specified from one manufacturing source having design responsibility

3.3

pliable corrugated tubing

tubing capable of being bent easily by hand a limited number of times

3.4

cover

tubular outer sheath applied to the pliable corrugated tubing

3.5

sleeve

local tubular outer sleeve intended to protect a pliable corrugated tubing connection to a fitting from corrosion or mechanical damage

3.6

bend radius

radius measured to the centre line of the pliable corrugated tubing

3.7

PLT fitting

unique fitting using mechanical attachment methods, in which tightness is achieved with or without seals, excluding other joining methods such as welding, brazing, soldering or gluing

3.7.1

end fitting

PLT fitting intended to join a pliable corrugated tubing section to another component

3.7.2

coupling

PLT fitting intended to join two sections of pliable corrugated tubing

3.7.3

tee

PLT fitting to join two or three sections of the pliable corrugated tubing

3.7.4

manifold

PLT fitting designed to join 4 or more sections of pliable corrugated tubing

3.8

seal

any part intended to perform leak tightness within a PLT fitting

3.9

support

element used to fix the PLT system to the structure of the building

3.10

rated flow rate

flow rate, under standard reference conditions

3.11

maximum operating pressure (MOP)

maximum operating pressure at which a PLT system can be operated under normal conditions

3.12

qualified installer

any trained and proved installer responsible for the installation or replacement of PLT systems qualified by the PLT manufacturer and authorised by the relevant National Authorities

3.13

competent person

person who is trained, experienced and approved to perform specific activities.

NOTE Means of approval relating to gas pipework are determined within each country.

3.14

authorised person

competent person who is appointed to fulfil a given task on gas pipework

3.15

family

group of products produced by one manufacturer for which test results for one member of that group are valid for the whole group

4 Design requirements

4.1 General

Where additional components are required to complete the gas tubing system, these components should be provided or specified by the system supplier.

4.2 System

A system shall consist of the following components as a minimum:

- stainless steel pliable corrugated tubing;
- fittings including tees and manifolds;
- supports.

4.3 Materials

Materials for the manufacture of PLT system shall be selected from the Table 1 and on the basis of their suitability for fabrication, e.g. welding, cold forming, etc. as appropriate, and for the conditions under which they will be used.

Table 1 — Materials

Component	Material
Corrugated pliable tubing	Stainless steel according to EN 10028-7: 1.4306, 1.4541, 1.4404, 1.4401, 1.4571 1.4435
PLT fittings	Stainless steel according to EN 10088-3, copper alloys according to EN 12164 and EN 12165
PLT manifold/tees	Stainless steel according to EN 10088-3, copper alloys according to EN 12164 and EN 12165 Malleable cast iron according to EN 10242 types W 400-05; W 350-04; B 350-10 or B 300-06
Cover	Synthetic material ^a
Supports	Metallic corrosion resistant material

^a If the materials of the synthetic cover contain corrosive agents as ingredients such as sulphur or chlorine, care shall be taken to ensure that such agents are not released during the manufacturing process or during normal service condition

4.4 Nominal size DN and pressure drop

The nominal size of a PLT system shall be selected from the DN given in EN ISO 10380:2003, Table 2 and the nominal size range shall be from DN 10 to DN 50.

The minimum bore size of the pliable corrugated tubing shall be at least 98 % of the nominal size DN.

The manufacturer shall state the related pressure drop for each nominal size DN.

4.5 Threads

The threads used to connect to standard components (tees, manifold, etc) shall conform to EN 10226-1. Other threads, if used for the PLT attachment, shall be of a different thread design.

4.6 PLT fittings

4.6.1 General

PLT fittings and non-permanently attached parts, whether surface finished or not, shall be manufactured from materials listed in Table 1. Copper alloys shall contain at least 57 % copper and up to 3,5 % lead in accordance with EN 12164 and/or EN 12165.

4.6.2 Stress corrosion

All fittings and components of copper alloy shall be free of stress corrosion.

Stress corrosion resistance shall be determined in accordance with ISO 6957 with a pH 9,5.

4.6.3 Dezincification

All copper or copper alloys components shall resist dezincification.

If an alloy contains more than 10 % of zinc, its corrosion behaviour shall be assessed according to EN ISO 6509.

4.7 Adaptors

The manufacturer shall design and make publicly available adaptors to connect their own PLT system to other gas supply systems. The adaptors shall fulfil the requirements of this standard.

4.8 Seals, sealing agents

Where seals or sealing agents are used in the PLT system, they shall comply with gas use requirements and shall fulfil local and/or National Regulations.

4.9 Environment

A PLT systems shall be resistant to any corrosive agent reasonable foreseen in the field of the expected conditions of use.

When installed outdoors, climatic conditions shall be taken into account, for example: UV, rain, ice, etc.

PLT shall withstand a temperature range of – 40 °C to 60 °C.

Where exposed, sections of PLT systems shall be able to be protected against foreseeable mechanical damage.

NOTE Trunking may be used to fulfil this requirement.

4.10 Supports

Supports shall be made of materials mechanically and chemically harmless with regard to the other components of the PLT system.

In the event of a fire manifolds and fittings shall be so supported that they remain in place. Pliable corrugated tubing shall remain in place; and may sag but shall not impede protected fire escape routes.

During the test of a single burning item according to EN 13823:2002, the pliable corrugated tubing shall be installed with its system supports and shall remain in place.

4.11 Electrical conductivity requirements

PLT systems shall be electrically conductive.

Equipotential bonding to the building and isolation from underground pipework shall comply with National Regulations.

4.12 Cover

The manufacturer shall apply a coloured cover onto the pliable corrugated tubing to improve the resistance of the tubing to external corrosion and mechanical damage.

The colour shall be selected from local and/or National Regulations relating to gas supply.

All types of synthetic cover used within the range of a PLT system shall be tested.

5 Performance and test requirements

5.1 General

The number and the type of samples of stainless steel pliable corrugated tubing system to be tested, tests and compliance criteria are given in 6.2.1.3, Table 12.

If any nominal size fails one of the tests within the test sequence schedule given in 5.1.2, Table 3, then all samples of that nominal size will be deemed to have failed to meet the type test requirements of this standard.

Unless otherwise specified, the tests shall be performed at a temperature of 20 ± 2 °C.

Unless otherwise specified the tests shall be carried out with the cover in place.

Unless otherwise specified the tests performed will qualify the other sizes in the same family as specified in Table 2. Tests results shall only apply to samples of the same design and same material.

Table 2 — Test requirements

Nominal size to be tested	Family	Qualified diameters DN
DN 12	X	DN 10 - DN 12 - DN 15
DN 25	Y	DN 20 - DN 25 - DN 32
DN 50	Z	DN 40 - DN 50

5.1.1 Type of PLT system sample

The PLT system samples used in the following tests shall be assembled in accordance with the manufacturers' instructions. Prior to assembling, each length of the pliable corrugated tubing shall be tested according to 5.3. Depending on the test, Type 1 (see Figure 1) or Type 2 (see Figure2) shall be used.

Type 1:

End fitting – pliable corrugated tubing – end fitting

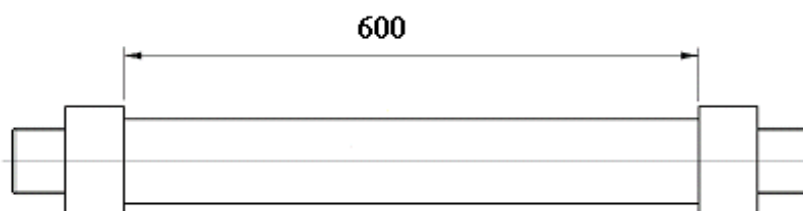


Figure 1 — PLT sample Type 1