

SLOVENSKI STANDARD
oSIST prEN 16125:2010
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**Oprema in pribor za utekočinjeni naftni plin (UNP) - Cevovodi in podporni elementi
- UNP tekoča faza in parna faza pod tlakom**

LPG equipment and accessories - Pipework systems and supports - LPG liquid phase
and vapour pressure phase

Flüssiggas-Geräte und -Ausrüstungsteile - Rohrleitungssysteme und -befestigungen -
Flüssigphase und unregelmäßige Gasphase von Flüssiggas (LPG)

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75.200	Oprema za skladiščenje naftne, naftnih proizvodov in zemeljskega plina	Petroleum products and natural gas handling equipment

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LPG equipment and accessories - Pipework systems and supports - LPG liquid phase and vapour pressure phase

Flüssiggas-Geräte und Ausrüstungsteile -
Flüssiggas(LPG)-Verrohrung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 286.

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Foreword

This document (prEN 16125:2010) has been prepared by Technical Committee CEN/TC 286 “Liquefied petroleum gas equipment and accessories”, the secretariat of which is held by NSAI.

This document is currently submitted to the CEN Enquiry.

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Introduction

This European Standard calls for the use of substances and procedures that may be injurious to health and/or the environment if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations at any stage.

Protection of the environment is a key political issue in Europe and elsewhere. Protection of the environment is taken in a very broad sense. What is meant is the total life cycle aspects of, e.g. a product on the environment, including expenditure of energy and during all phases from mining of raw materials, fabrication, packaging, distribution, use, scrapping, recycling of materials, etc.

NOTE Annex F indicates which clauses in this standard address environmental issues.

It is recommended that manufacturers develop an environmental management policy. For guidance see ISO 14000 series. It has been assumed in the drafting of this European Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

All pressures are gauge unless otherwise stated.

NOTE This standard requires measurement of material properties, dimensions and pressures. All such measurements are subject to a degree of uncertainty due to tolerances in measuring equipment etc. It may be beneficial to refer to the leaflet "measurement uncertainty leaflet (SP INFO 2000 27 uncertainty pdf)"

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prEN 16125:2010 (E)

1 Scope

This standard specifies the requirements for the design, construction, testing, commissioning, operation and maintenance of LPG pipework in the liquid phase and at full vapour pressure.

This standard is not applicable to:

- pipelines and their accessories;
- pipework for the propulsion of road vehicles or boats;
- pipework on ships.

This standard is applicable to installation pipework having a maximum operating pressure less than or equal to 30 bar.

This standard is applicable to new installation pipework as well as to replacements of, or extensions to, existing installation pipework.

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 751-1, *Sealing Materials for Metallic Threaded Joints in Contact with 1st, 2nd and 3rd Family Gases and Hot Water - Part 1: Anaerobic Jointing Compounds*

EN 751-2, *Sealing Materials for Metallic Threaded Joints in Contact with 1st, 2nd and 3rd Family Gases and Hot Water - Part 2: Non-Hardening Jointing Compounds*

EN 751-3, *Sealing Materials for Metallic Threaded Joints in Contact with 1st, 2nd and 3rd Family Gases and Hot Water - Part 3: Unsintered PTFE Tapes*

EN 1044, *Brazing - Filler Metals*

EN 1045, *Brazing - Fluxes for Brazing - Classification and Technical Delivery Conditions*

EN 1057, *Copper and Copper Alloys - Seamless, Round Copper Tubes for Water and Gas in Sanitary and Heating Applications*

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

EN 1092-3, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated Part 3: Copper alloy flanges.*

EN 1254-1, *Copper and Copper Alloys - Plumbing Fittings - Part 1: Fittings with Ends for Capillary Soldering or Capillary Brazing to Copper Tubes*

EN 1254-2, *Copper and Copper Alloys - Plumbing Fittings - Part 2: Fittings with Compression Ends for Use with Copper Tubes*

EN 1254-5, *Copper and Copper Alloys - Plumbing Fittings - Part 2: Fittings with Compression Ends for Use with Copper Tubes Part 5: Fittings with Short Ends for Capillary Brazing to Copper Tubes*

- EN 1515-1, *Flanges and their joints - Bolting - Part 1: Selection of bolting*
- EN 10088-3, *Stainless steels Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes*
- EN 10208-1, *Steel pipes for pipelines for combustible fluids — Technical delivery conditions Part 1: Pipes of requirement class A*
- EN 10216-5, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 5: Stainless steel tubes*
- EN 10217-7, *Welded steel tubes for pressure purposes Technical delivery conditions Part 7: Stainless steel tubes*
- EN 10226-1, *Pipe threads where pressure tight joints are made on the threads Part 1: Taper external threads and parallel internal threads dimensions, tolerances and designation*
- EN 10226-2, *Pipe threads where pressure tight joints are made on the threads - Part 2: Taper, external threads and taper internal threads*
- EN 10226-3, *Pipe threads where pressure tight joints are made on the threads - Part 3: Verification by means of limit gauges*
- EN 10253-2, *Butt-welding pipe fittings — Part 2: Non alloy and ferritic alloy steels with specific inspection requirements*
- EN 10255, *Non-alloy steel tubes suitable for welding and threading — Technical delivery conditions*
- EN 12007-1, *Gas infrastructure - Pipelines for maximum operating pressure up to and including 16 bar - Part 1: General functional recommendation*
- EN 12007-3, *Gas infrastructure - Pipelines for maximum operating pressure up to and including 16 bar - Part 3: Specific functional requirements for steel*
- EN 12266-1, *Industrial valves - Testing of metallic valves - Part 1: Pressure tests, test procedures and acceptance criteria - Mandatory requirements*
- EN 12266-2, *Industrial valves - Testing of metallic valves - Part 2: Tests, test procedures and acceptance criteria - Supplementary requirements*
- EN 13175, *LPG equipment and accessories - Specification and testing for Liquefied Petroleum Gas (LPG) tank valves and fittings*
- EN 13480-2, *Metallic industrial piping - Part 2: Materials*
- EN 14324, *Brazing - Guidance on the application of brazed joints*
- EN 15001-1:2006, *Gas Infrastructure - Gas installation pipework with an operating pressure greater than 0,5 bar for industrial installations and greater than 5 bar for industrial and non-industrial installations - Part 1: Detailed functional requirements for design, materials, construction, inspection and testing*
- EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*
- EN ISO 9453, *Soft solder alloys - Chemical compositions and forms (ISO 9453:2006)*
- EN ISO 9454-2, *Soft soldering fluxes - Classification and requirements - Part 2: Performance requirements (ISO 9454-2:1998)*

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EN ISO 10497, *Testing of valves - Fire type-testing requirements (ISO 10497:2010)*

3 Terms and definitions

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

- 3.1 accessible**
access can be gained without hazard or undue difficulty for inspection, repair, renewal, or operational purposes
- 3.2 commissioning**
Activities performed to put pipework into operation in accordance with the design.
- 3.3 competent person**
Person, who is trained, experienced and approved to perform activities relating to gas pipework.
- 3.4 critical velocity**
The velocity at which turbulent flow begins.
- 3.5 design pressure (DP)**
Pressure at which the design calculations are based
- 3.6 fitting**
A component used to join pipes, or to change direction or diameter of a pipe, or to provide a branch, or to terminate a pipe.
- 3.7 gas installation**
A combination of the following used or intended to be used in the supplying and utilisation of gas, taken as separate items or as a whole: Consumer piping, fittings, components, appliances, flues, sub-meters, apparatus or other devices and associated requirements.
- 3.8 interlock**
A device or function that ensures that the operation of items of equipment is dependent upon the fulfilment of predetermined conditions by other items of equipment.
- 3.9 joint**
Means of joining elements of a gas installation
- 3.10 LPG (liquefied petroleum gas)**
mixture of predominantly butane or propane with traces of other hydrocarbon gases classified in accordance with UN number 1965, hydrocarbon gases mixture, liquefied, NOS or UN number 1075, petroleum gases, liquefied
- NOTE In some countries, UN numbers 1011 and 1978 may also be designated LPG.
- 3.11 maximum incidental pressure (MIP)**
Maximum pressure at which a system can experience during a short time, limited by the safety devices

3.12**maximum operating pressure (MOP)**

Maximum pressure at which a system can be operated continuously under normal operating conditions

3.13**mechanical joint**

Joint in which gas tightness is achieved by compression with or without a seal.

Note This joint can be readily disassembled and reassembled.

3.14**nominal size (DN)\nominal diameter (DN)**

A numerical designation of size, in millimetres (mm) which is common to all components in a piping system other than components designated by outside diameters or by thread size. It is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions.

3.15**non-return valve**

A valve designed to operate automatically to prevent reversal of flow in a pipe.

3.16**operation pressure(OP)**

Pressure which occurs within a system under normal operating conditions

3.17**design pressure**

pressure for which the designer allows in specifying materials and construction methods in order that the pipework will withstand the maximum incidental pressure, tightness test pressure or strength test as applicable

3.18**pressure**

Pressure above atmospheric pressure, or gauge pressure.

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3.19**purge/purging/purged**

With respect to consumer piping means—

(a) replacing the air in consumer piping with gas or inert gas; or

(b) removing the gas, liquid or vapour phase from consumer piping by replacing the gas with either air or an inert gas.

NOTE The purpose of purging is to prevent the presence in the piping of an explosive mixture of gas and air.

3.20**sleeve**

Protective pipe through which a gas pipe passes.

3.21**strength test**

Specific procedure intended to verify that the pipework meets the requirements for mechanical strength.

3.22**strength test pressure (STP)**

pressure applied to pipework during strength testing

prEN 16125:2010 (E)**3.23****thread joint**

joint in which tightness is achieved by metal to metal contact within threads with the assistance of a sealant.

3.24**tightness test pressure**

Pressure applied to pipework during tightness testing

3.25**pipeline**

Piping designed for the conveyance of any fluid or substance to or from an installation (onshore or offshore) starting from and including the last isolation device located within the confines of the installation, including all the annexed equipment designed specifically for pipelines

NOTE This definition is extracted from 97/23/EC (PED)

4 Design safety considerations**4.1 General**

4.1.1 Any person who is responsible for the design of a LPG installation shall be a competent person.

4.1.2 The pipework designer shall provide information on the design and location of pipework to the persons responsible for construction, installation and operation of pipework.

4.1.3 The pipework shall be designed, installed and constructed to allow testing and purging to be carried out.

4.1.4 Above ground piping shall be protected against mechanical damage where necessary.

4.1.5 Pipework joints shall be kept to a minimum.

4.2 Environmental considerations

The designer shall consider the selection of pipe material and components with regard to the use of production processes, practices, materials or products that avoid reduce or control pollution, including recycling, treatment, process changes, control mechanisms, efficient use of materials and material substitution.

NOTE Every product has some impact on the environment. These impacts may occur at any or all stages of the product's life cycle and can be local, regional or global, or a combination of all three.

4.3 Protection against hazards**4.3.1 Resistance to corrosive substances and atmospheres**

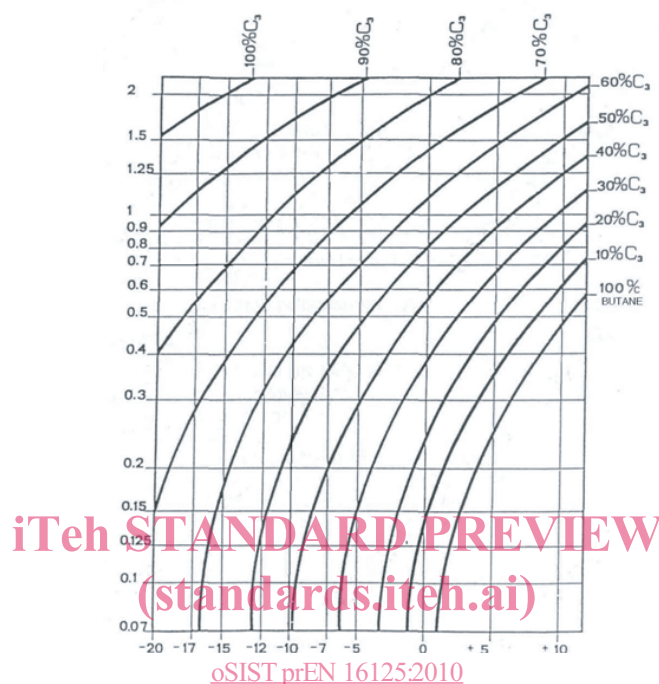
Pipework including supports in contact with soil or building materials, which can be expected to contain corrosive substances, or in contact with corrosive atmosphere shall be resistant to or protected against these substances.

4.3.2 Protection against variations in the operating pressure

The designers of pipework shall take into consideration variations of operating pressures resulting from ambient temperature fluctuation.

4.4 Protection against condensation

For vapour pressure pipework covered by this standard, precaution shall be taken to avoid condensation occurring in the pipe. The selection of pressure to be used is of great importance, especially in cold climates. If the design pressure is too high or the temperature too low, the LPG will condense to a liquid. This is known as the dew point. The dew point graph figure 1 indicates temperatures and pressures for propane, mixes of propane/butane and butane. The area above each curve will cause gas to condense to a liquid.



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Figure 1 – Dew point graph

This may take the form of heat tracing the pipework or alternatively making the use of LPG air-mixture. Alternatively a suitably located knock-out pot shall be installed in the line to allow condensation to collect and subsequently boil off without causing overpressure problems.

5 Materials

5.1 General

Materials and components shall be free from damage and defects and shall be suitably selected for the intended use.

5.2 New materials and new components

New materials and new components shall comply with one or more of the standards listed in Tables 3 and 4.

5.3 Reuse of materials and components

Materials and components can be reused if they comply with the following requirements:

- Be manufactured to one of the standards listed in Tables 3 and 4;
- Be suitable for the proposed service in light of the history of the material or component, and;