SLOVENSKI STANDARD
oSIST prEN 17613:2020

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Oprema in pribor za utekočinjeni naftni plin (UNP) - Cevi iz kompozitnih materialov za UNP v tekoči in parni fazi - Konstruiranje in izdelava

LPG equipment and accessories - Composite piping for use with LPG in liquid phase and vapour pressure phase - Design and manufacture

Flüssiggas-Geräte und Ausrüstungsteile - Verrohrung aus Verbundwerkstoffen zum Einsatz mit LPG in der Flüssig- und Gasdruck-Phase - Konstruktion und Herstellung

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23.040.01	Deli cevovodov in cevovodi na splošno	Pipeline components and pipelines in general

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English Version

LPG equipment and accessories - Composite piping for use with LPG in liquid phase and vapour pressure phase - Design and manufacture

Flüssiggas-Geräte und Ausrüstungsteile - Verrohrung aus Verbundwerkstoffen zum Einsatz mit LPG in der Flüssig- und Gasdruck-Phase - Konstruktion und Herstellung

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

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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 17613:2020) has been prepared by Technical Committee CEN/TC 286 “LPG equipment and accessories”, the secretariat of which is held by NSAI.

This document is currently submitted to the CEN Enquiry.

Introduction

This document 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.

This document is intended for users who take on the responsibility for the manufacturing of composite pipework.

Protection of the environment is a key political issue in Europe and elsewhere. For CEN/TC 286 this is covered in CEN/TS 16765 and this Technical Specification should be read in conjunction with this document. This document provides guidance on the environmental aspects to be considered regarding equipment and accessories produced for the LPG industry and the following is addressed:

a) design;

b) manufacture;

c) packaging;

d) use and operation; and

e) disposal.

It is recommended that manufacturers develop an environmental management policy. For guidance see EN ISO 14004. It has been assumed in the drafting of this document that the execution of its provisions is entrusted to appropriately qualified and experienced people.

All pressures are gauge unless otherwise stated.

NOTE This document uses 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 could be beneficial to refer to the leaflet “measurement uncertainty leaflet (SP INFO 2000 27 uncertainty.pdf)”.

1 Scope

This document specifies requirements for the design, manufacture and testing of composite piping for use with LPG in liquid phase and vapour pressure phase.

This document is applicable to LPG composite piping having a maximum allowable pressure of less than or equal to 25 bar.

NOTE For installation of composite pipework systems see EN 16125.

This document applies to pipes where the first layer of the pipework containment in contact with the LPG is of thermoplastic material which may include some degree of reinforcement.

It does not apply to fibre reinforced thermosets, commonly referred to as glass fibre reinforced plastic (GRP), nor rigid metals or corrugated metal pipework or hoses to EN ISO 10380.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 549, *Rubber materials for seals and diaphragms for gas appliances and gas equipment*

EN 1555-1, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 1: General*

EN 1555-2, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 2: Pipes*

EN 1555-3, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 3: Fittings*

EN 1555-4, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 4: Valves*

EN 1555-5, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 5: Fitness for purpose of the system*

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

EN 12201-2:2011+A1:2013, *Plastics piping systems for water supply, and for drainage and sewerage under pressure - Polyethylene (PE) - Part 2: Pipes*

EN 14125:2013, *Thermoplastic and flexible metal pipework for underground installation at petrol filling stations*

EN 16125, *LPG Equipment and Accessories - Pipework systems and supports - LPG in liquid phase and vapour pressure phase*

EN 60243-2, *Electric strength of insulating materials - Test methods - Part 2: Additional requirements for tests using direct voltage*

CLC/TR 60079-32-1:2018, *Explosive atmospheres - Part 32-1: Electrostatic hazards, guidance*

CEN/TS 16769, *LPG equipment and accessories - Terminology*

EN ISO 14692-2:2017, *Petroleum and natural gas industries - Glass-reinforced plastics (GRP) piping - Part 2: Qualification and manufacture (ISO 14692-2:2017)*

ISO 11922-1, *Thermoplastics pipes for the conveyance of fluids — Dimensions and tolerances — Part 1: Metric series*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TS 16769 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
design temperature
T_{des}
for each design condition, maximum fluid temperature that can be reached during service

[ISO 14692-1:2017, 3.2.18]

3.2
fitting
pressure containing component fitted to an LPG pressure system

3.3
Liquefied Petroleum Gas
LPG
low pressure liquefied gas composed of one or more light hydrocarbons which are assigned to UN 1011, UN 1075, UN 1965, UN 1969 or UN 1978 only and which consists mainly of propane, propene, butane, butane isomers, butene with traces of other hydrocarbon gases

3.4
maximum allowable pressure
maximum pressure for which the equipment is designed

Note 1 to entry: All pressures are gauge pressures unless otherwise stated.

3.5
pipework
pressure containing enclosure used for the conveyance of LPG consisting of pipe, pipe fittings, valves and other accessories

3.6
piping
assemblies of piping components used to convey, distribute, mix, separate, discharge, meter, control or restrict fluid flows

4 Materials

All materials in contact with LPG shall be physically and chemically compatible with LPG under all operating conditions for which the pipework is designed.

Materials for pipework shall be selected to give adequate strength in service.

Materials and components shall comply with one or more of the following standards: EN 1555-1, EN 1555-2, EN 1555-3, EN 1555-4, EN 1555-5, ISO 11922-1, EN 10088-1 and EN 549.

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

— are suitable for the proposed service in light of the history of the material or component;

— are inspected since the previous use to reveal any defect that could impair safety, strength or pressure tightness; and

— pressure tested before it is covered in the ground, see EN 16125.

5 Design Criteria

Pipework used in accordance with this document shall be suitable for the following conditions:

— a minimum operating temperature of −20 °C. In service, temperatures below this can be encountered during short periods, for example, when filling. In some parts of Europe and in certain applications where a lower temperature than −20 °C can be encountered, the minimum design temperature shall be −40 °C;

— the maximum working temperature shall be 65 °C for above ground pipework and 40 °C for underground pipework;

— the maximum allowable pressure for pipework shall be less than or equal to 25 bar;

— pipes shall be suitable for transport and storage at −40 °C and 65 °C; and

— pipes shall be designed to have an estimated working life of at least 25 years.

NOTE 1 Vacuum conditions on the pipework arising from butane at low temperature or evacuation of the pipework can expose the pipework to a vacuum of 50 mbar absolute. The minimum pressure to which pipework is normally exposed is 0 bar.

NOTE 2 For design of composite pipework system installation refer to EN 16125.

6 Environmental

The manufacturer should acquire materials and components from suppliers who have a declared environmental policy, see EN ISO 14021, EN ISO 14024 and EN ISO 14025.

7 Fittings

7.1 General

All pipes shall include fittings to provide leak-tight attachment to other systems, terminations, branches and changes of direction.

7.2 Dimensional tolerances

The external diameter and wall thickness shall be stated by the manufacturer. For thermoplastic pipes the tolerance on the external diameter and out-of-roundness shall be in accordance with ISO 11922-1, Grade B.

8 Physical properties

8.1 Pressure

Operating and test pressures shall be in accordance with Clause 5.

8.2 Temperature

Pipes and fittings used in accordance with this European Standard shall comply with the requirements of Clause 5.

9 Testing

9.1 Internal burst pressure test

The internal burst pressure test shall be carried out in accordance with EN ISO 14692-2:2017, 6.2.4.

9.2 Fitting pull-out test

The fitting pull-out test shall be carried out in accordance with EN 14125:2013, 7.2.11.

9.3 Resistance to internal pressure test

The internal pressure test shall be carried out in accordance with EN 12201-2:2011+A1:2013, 7.2 and Table 3.

9.4 Static electricity

9.4.1 General

Ignition hazards by static electricity caused by fuel pipe systems shall be avoided. More information about electrostatic hazards can be found in CLC/TR 60079-32-1.

9.4.2 Classification of pipes

The following boundary limits are used for classifying the resistance of piping according to ISO 8031, into the categories given as follows:

Conductive: Dissipative Insulating:

resistance per unit length < 103 Ω m-1

103 Ω m-1 ≤ resistance per unit length ≤ 106 Ω m-1 resistance per unit length > 106 Ω m-1

The resistance per unit length shall include the effect of one coupling.