

# **SLOVENSKI STANDARD**

## **SIST EN 14570:2005**

**01-julij-2005**

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### **Oprema za podzemne in nadzemne rezervoarje za utekočinjeni naftni plin (UNP)**

Equipping of LPG tanks, overground and underground

Ausrüstung von Behältern für Flüssiggas (LPG), oberirdische und unterirdische Aufstellung

Équipement des réservoirs GPL aériens et enterrés

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#### **ICS:**

23.020.10	Nepremične posode in rezervoarji	Stationary containers and tanks
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 14570**

May 2005

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English version

**Equipping of LPG tanks, overground and underground**

Équipement des réservoirs GPL aériens et enterrés

Ausrüstung von Behältern für Flüssiggas (LPG),  
oberirdische und unterirdische Aufstellung

This European Standard was approved by CEN on 15 December 2004.

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.

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

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

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## Foreword

This document (EN 14570:2005) has been prepared by Technical Committee CEN/TC 286 “Liquefied petroleum gas equipment and accessories”, the secretariat of which is held by NSAI.

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of an identical text or by endorsement, at the latest by November 2005, and conflicting national standards shall be withdrawn at the latest by November 2005.

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 97/23/EC.

For relationship with EU Directive 97/23/EC, see informative Annex ZA, B, C or D, which is an integral part of this document.

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

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**EN 14570:2005 (E)****1 Scope**

This European Standard specifies requirements for the equipping of LPG tanks, overground and underground, with a volume not greater than 13 m<sup>3</sup> manufactured in accordance with EN 12542, EN 14075; or equivalent and have been hydraulically tested. The equipment covered by this European Standard is directly mounted onto the tank connections.

This European Standard excludes the equipping of depot storage tanks and refrigerated storage tanks.

**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 751-2:1996, *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 751-3:1996, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water - Part 3: Unsintered PTFE tapes*

EN 12542:2002, *Static welded steel cylindrical tanks, serially produced for the storage of Liquefied Petroleum Gas (LPG) having a volume not greater than 13 m<sup>3</sup> and for installation above ground - Design and manufacture*

EN 13153, *Specification and testing of LPG cylinder valves - Manually operated*

EN 13175, *Specification and testing for Liquefied Petroleum Gas (LPG) tank valves and fittings*

EN 13799, *Contents gauges for LPG tanks*

EN 14071, *Pressure relief valves for LPG tanks - Ancillary equipment*

EN 14075:2002, *Static welded steel cylindrical tanks, serially produced for the storage of Liquefied Petroleum Gas (LPG) having a volume not greater than 13 m<sup>3</sup> and for installation underground - Design and manufacture*

EN 14129, *Pressure relief valves for LPG tanks*

EN ISO 10497, *Testing of valves - Fire type-testing requirements (ISO 10497:2004)*

**3 Terms, definitions and abbreviations****3.1 Terms and definitions**

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

**3.1.1****fixed level gauge**

device to indicate when a predetermined liquid level in a tank has been reached or surpassed

**3.1.2****off-take connection**

opening from which product in the liquid or vapour phase is drawn from the tank for the purpose of being consumed

**3.1.3****depot storage tank**

LPG tank at an installation where LPG is stored before being transferred into bulk tankers and/or LPG cylinders for distribution

**3.1.4****remotely operated**

operated from a point at least 3 metres from the tank

**3.1.5****drainage**

process of removal of residual tank content

**3.1.6****liquid removal**

withdrawal of LPG from the tank for a purpose different from the normal use of the LPG (e.g. removal of LPG for decommissioning, maintenance or in case of an emergency)

**3.1.7****tank vapour service**

tank equipped for delivery of vapour to the customer through natural vaporisation

**3.1.8****tank liquid service**

tank equipped for delivery of liquid to the customer

**3.1.9****connection**

boss, flange, pad provided at an opening for the purpose of attaching equipment piping or pipe fittings

**3.1.10****fail-safe shut-off valve**

valve that returns to its safe position in case of actuating power failure or fire engulfment failure

**3.1.11****shut-off valve**

valve to provide a leak-tight seal which is operated manually, remotely or is self-closing

**3.1.12****automatic maximum fill level control**

device that automatically stops the filling of liquid into the tank when a predetermined level has been reached

**3.1.13****thermal expansion valve**

self-closing valve which automatically, without the assistance of any energy other than that of the fluid concerned, discharges fluid at a predetermined pressure

**3.2 Abbreviations**

PRV	Pressure Relief Valve,
PS	Maximum allowable pressure
PED	Pressure Equipment Directive (Directive 97/23/EC )

**EN 14570:2005 (E)****4 Tank equipment****4.1 General**

The supplier of the equipped tank or the tank user/owner shall have a written procedure covering all aspects of the selection and assembling of the equipment and for testing of the equipped tank.

Tank connections, that are not in use or piped up during normal operation, shall be plugged or blanked off. A valve may be fitted between the connection and the plug or blind flange.

Except for PRVs and level gauges, all operating valves shall be protected from unauthorized operations. This can be achieved by enclosure within a lockable valve cover, secure compound or other suitable means.

In the case of underground/mounded tanks, when valves are below the ground/backfill level, the valves shall be enclosed in a suitable access chamber.

**4.2 Selection of tank equipment**

The selection of tank equipment is related to the size of the tank and / or the complexity of the operation, and shall match the level of safety required.

Tank equipment shall be rated for the maximum allowable pressure of the tank (PS).

Tank equipment shall be selected to meet the design conditions of the tank and shall be in accordance with EN 13175 (or EN 13153 for manual shut-off valves up to DN 25), EN 13799, EN 14071 and EN 14129, as appropriate.

Normal service connections, where the passageway diameter into the tank is greater than 1,5 mm and up to 3 mm for liquid and 8 mm for vapour, shall be equipped with a shut-off valve.

Normal service connections, where the passageway diameter into the tank is greater than 3 mm for liquid and 8 mm for vapour, shall be equipped with at least one of the following.

- a remotely operated fail-safe shut-off valve;
- an excess flow valve plus manual shut-off valve;
- a non-return valve plus manual shut-off valve.

Where two valves are fitted, they shall be located as close as practicable to each other.

These requirements shall not apply to:

- PRV's;
- filler connections including a double non-return valve;
- occasional withdrawal valves which include an integral excess flow/non-return valve; and
- level gauges.

Where valve actuators are fitted, they shall be sized to operate the valve at the maximum pressure likely to be seen in service.

Remotely operated failsafe shut-off valves shall be fire safe in accordance with EN ISO 10497 and shall close in a controlled manner so as to avoid excessive pressure surge in the piping system, unless provision is made to protect the pipe-work in such a situation.



### 4.3 Screwed joints

Screwed joints shall only be used for joint sizes of DN 50 or less. However, larger screwed joints are permissible for proprietary items such as relief valves. Where the thread provides the seal, tapered threads shall be used.

### 4.4 Seals and gaskets

Seals and gaskets shall be selected taking account of the maximum allowable pressure of the tank (PS).

Gaskets shall be selected to match the size and design of the flanges and be used in strict accordance with the manufacturer's specifications and recommendations.

PTFE tape shall comply with EN 751-3:1996 Class G. Thread sealing compounds shall be non-hardening types complying with EN 751-2:1996 Class C.

## 5 Operational functions

### 5.1 General

Tanks shall be equipped to provide the operational functions detailed as "Mandatory" in Table 1.

Tanks may be equipped to provide the operational functions detailed as "Optional" in Table 1.

**Table 1 — Operational functions**

Function	Clause	Tank vapour service	Tank liquid service
Pressure relief	5.2	M	M
Drainage	5.3	O	O
Liquid removal	5.4	M <sup>a</sup>	O
Maximum fill or indication/control	5.5	M	M
Filling system	5.6	M	M
Vapour off-take	5.7	M	O
Vapour return	5.8	O	O
Liquid off-take	5.9	O	M
Liquid return	5.10	O	O
Temperature indication	5.11	O	O
Pressure indication	5.12	O	O
Liquid Level indication	5.13	M	M
Potential bonding point <sup>b</sup>	5.14	O	O
Earthing <sup>b</sup>	5.15	O	O
<sup>a</sup> Where liquid take-off is provided this becomes Optional <sup>b</sup> Unless required by national regulations NOTE 1 M = Mandatory, O = Optional. NOTE 2 Depending upon operational or safety requirements, remote operation or reading may be provided as desired, except for PRVs. NOTE 3 Underground or mounded and semi-mounded tanks are not earthed if they are fitted with a cathodic protection system.			

**EN 14570:2005 (E)****5.2 Pressure relief****5.2.1 General**

The tank shall be protected by a PRV(s) in accordance with Annex B.

Underground/mounded tanks may be exempted from the requirements on a PRV or a thermal expansion valve, if the tank is protected from over pressure during operation by alternative means. This shall be clearly indicated in the manufacturer's operating/installation instructions.

An example of appropriate alternative means is given in Annex A.

PRVs shall be connected to the vapour phase of the tank.

If the PRV or thermal expansion valve is located inside the valve cover, the cover shall be provided with a sufficient sized hole so as to allow free discharge.

PRVs shall be fitted with rain protective devices that will not obstruct the free discharge of gas.

**5.2.2 Isolating devices and manifolds**

**5.2.2.1** Shut-off valves shall not be fitted between a PRV and the tank. However, a suitable isolating device may be used to facilitate the exchange of the PRV, provided this device is retained in the fully open position by the presence of the relief valve and closes before the relief valve is completely removed (see EN 14071).

**5.2.2.2** Any manifold for PRVs shall be in accordance with EN 14071.

**5.2.3 Vent pipes**

If vent pipes are fitted, they shall:

- be in accordance with EN 14071;
- be positioned so that they discharge to a safe location;
- be designed and installed so that in the event of ignition of discharged LPG, flame impingement on any tank equipment, piping or other LPG equipment is avoided;
- be protected against internal/external corrosion;
- have a water drain point, unless provided by the PRV;
- be designed so as not to induce vibrations that might affect the PRV operation, either because of wind effect or when the PRV discharges;
- be made from a material which is not affected by the heat resulting from ignition of the gas release.

**5.3 Drainage**

If a drainage connection is provided it shall be fitted with:

- a shut-off valve which shall be blanked or plugged if not connected to a drainage system;
- an occasional liquid withdrawal valve or equivalent, or
- a blank or plug.

## 5.4 Liquid removal

The liquid removal system shall be in accordance with 4.2 with either:

- an eduction tube fitted with an "occasional liquid withdrawal valve" – (in accordance with EN 13175), the diameter of which shall not exceed DN 40. This type of valve shall not be used as a liquid off-take,

or

- an excess flow valve and a shut off valve.

## 5.5 Maximum fill indication/control

### 5.5.1 General

Tanks shall be provided with a maximum fill indication/control consisting of:

- a fixed level gauge;
- an automatic maximum fill level control.

The critical dimensions or operating point of the device(s) shall be based on the permitted maximum fill and the dimensions of the tank. The maximum fill shall be determined in accordance with Annex A in EN 14075:2002 and Annex A in EN 12542:2002.

### 5.5.2 Fixed level gauge

The bleed valve shall be installed so that it can be conveniently reached and is visible from the fill point and the direction of venting shall be away from the operator.

### 5.5.3 Automatic maximum fill level control

The automatic maximum fill level control shall monitor the level to automatically activate a device to terminate the filling operation.

## 5.6 Filling system

The tank filling system shall have a filling connection, which shall discharge directly, or via internal piping, into the vapour space of the tank.

The filler valve shall be located or designed to avoid interference with other functions (e.g. vapour off-take, liquid level indication).

## 5.7 Vapour off-take

The vapour off-take system shall have a connection, which shall connect directly, or via internal piping, into the vapour space of the tank.

The valve shall have an outlet connection compatible with a directly mounted regulator or connecting piping, and satisfy the requirements of 4.2.

## 5.8 Vapour return

The vapour return system shall have a connection, which shall connect directly, or via internal piping, into the vapour space of the tank.

It shall satisfy the requirements of 4.2.