



SLOVENSKI STANDARD
SIST EN 14291:2005

01-junij-2005

Penilne raztopineza preskušanje tesnosti plinskih napeljav

Foam producing solutions for leak detection on gas installations

Schaumbildende Lösungen zu Lecksuche an Gasinstallationen

Solutions moussantes pour détection de fuites sur les installations de gaz

Ta slovenski standard je istoveten z: EN 14291:2004

[SIST EN 14291:2005](https://standards.iteh.ai/catalog/standards/sist/9f9cd008-5c65-44f1-bee8-3d0e4d3cd5c5/sist-en-14291-2005)

<https://standards.iteh.ai/catalog/standards/sist/9f9cd008-5c65-44f1-bee8-3d0e4d3cd5c5/sist-en-14291-2005>

ICS:

91.140.40 Sistemi za oskrbo s plinom Gas supply systems

SIST EN 14291:2005

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 14291:2005](#)

<https://standards.iteh.ai/catalog/standards/sist/9f9cd008-5c65-44f1-bee8-3d0e4d3cd5c5/sist-en-14291-2005>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 14291

November 2004

ICS 23.040.99

English version

Foam producing solutions for leak detection on gas installations

Solution pour le détection des fuites aux installations de gaz

Schaumbildende Lösungen zu Lecksuche an Gasinstallationen

This European Standard was approved by CEN on 23 September 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.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

STANDARD PREVIEW
(standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/9f9cd008-5c65-44f1-bee8-3d0e4d3cd5c5/sist-en-14291-2005>



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

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

Contents

Page

Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Requirements	6
4.1 Surface tension	6
4.2 Foam stability.....	6
4.3 Corrosiveness.....	6
4.4 pH-value.....	6
4.5 Compatibility with non-hardening sealing materials and lubricants	6
4.6 Flammability	6
4.7 Freezing point	6
4.8 Toxicological harmlessness.....	6
5 Test samples and documentation.....	7
5.1 Test samples	7
5.2 Documentation.....	7
6 Test methods.....	7
6.1 Determination of surface tension.....	7
6.2 Determination of foam stability.....	7
6.3 Determination of corrosiveness.....	8
6.3.1 Corrosion attack on steel.....	8
6.3.2 Determination of anions.....	8
6.3.3 Corrosion attack on spray can	8
6.4 Determination of pH-value	9
6.5 Test of the compatibility with non-hardening sealing materials and lubricants.....	9
6.6 Determination of inflammability	9
6.7 Determination of freezing point.....	9
7 Marking	9

ITeH STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 14291:2005

<https://standards.iteh.ai/catalog/standards/sist/9f9cd008-5c65-44f1-bee8-3d0e4d3cd5c5/sist-en-14291-2005>

Foreword

This document (EN 14291:2004) has been prepared by Technical Committee CEN/TC 108 “Sealing materials and lubricants for gas appliances and gas equipment”, the secretariat of which is held by NEN.

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 May 2005, and conflicting national standards shall be withdrawn at the latest by May 2005.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 14291:2005](#)

<https://standards.iteh.ai/catalog/standards/sist/9f9cd008-5c65-44f1-bee8-3d0e4d3cd5c5/sist-en-14291-2005>

Introduction

There are different methods to detect and localize leaks on gas installation and gas equipment. One commonly used method is the application of surface-active aqueous solutions of detergents that produce foam on leaking gas installations. This standard specifies several important requirements for foam producing solutions especially for the detection of small leaks e.g. surface tension, foam stability, corrosiveness, and compatibility with sealing materials and lubricants.

It should be mentioned that excessive and repeated use of these aqueous detergent solutions on old threaded joints sealed with natural fibres (e. g. hemp or flax) and unsuitable sealing materials can temporarily seal a leaking joint by swelling of the natural fibres.

Since some plastic and copper pipe materials may be attacked by surface-active aqueous solutions of detergents used for leak detection, it is generally recommended to rinse plastic and copper pipes with water after leak detection by foam producing solutions according to this standard.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 14291:2005](https://standards.iteh.ai/catalog/standards/sist/9f9cd008-5c65-44f1-bee8-3d0e4d3cd5c5/sist-en-14291-2005)

<https://standards.iteh.ai/catalog/standards/sist/9f9cd008-5c65-44f1-bee8-3d0e4d3cd5c5/sist-en-14291-2005>

1 Scope

This document specifies requirements and test methods of foam producing solutions for leak detection (hereafter called leak detection solution) used for leak detection of combustible gases of the 1st family (town gas), 2nd family (natural gas), and 3rd family (liquefied petroleum gases (LPG)) (see EN 437) within the temperature range of $-15\text{ }^{\circ}\text{C}$ or $0\text{ }^{\circ}\text{C}$ to $50\text{ }^{\circ}\text{C}$. It is applicable for leak detection solutions, which are delivered as ready to use solutions, e.g. in spray cans.

Note The leak detection solution covered by this document may also be used for other compressed gases. In this case the producer has to be consulted.

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 377, *Lubricants for applications in appliances and associated controls using combustible gases except those designed for use in industrial processes.*

EN 437, *Test gases - Test pressures - Appliance categories.*

EN 456, *Paints, varnishes and related products - Determination of flashpoint - Rapid equilibrium method (ISO 3679:1983, modified).*

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 1412, *Copper and copper alloys - European numbering system.*

EN 10027 - 1, *Designation systems for steel - Part 1: Steel names, principal symbols*

EN ISO 10304 - 1:1995, *Water quality - Determination of dissolved fluoride, chloride, nitrite, orthophosphate, bromide, nitrate and sulfate ions, using liquid chromatography of ions - Part 1: Method for water with low contamination (ISO 10304-1:1992).*

ISO 304, *Surface active agents - Determination of surface tension by drawing up liquid films.*

ISO 696, *Surface active agents - Measurement of foaming power - Modified Ross-Miles-method.*

ISO 3819, *Laboratory glassware - Beakers.*

ISO 6974-4, *Natural gas- Determination of composition with defined uncertainty by gas chromatography- Part 4 Determination of nitrogen, carbon dioxide and C1 to C5 and C6+ hydrocarbons for a laboratory and on-line measuring system using two columns.*

ASTM D 1177, *Standard test method for freezing point of aqueous engine coolants.*

EN 14291:2004 (E)**3 Terms and definitions**

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

3.1**foam producing leak detection solution**

aqueous solution with low surface tension, which indicates small gas leaks by formation of foam bubbles

3.2**gas family**

for further information on types of gases see EN 437

4 Requirements**4.1 Surface tension**

Leak detection solutions shall enable the detection of small gas leaks, therefore the surface tension shall be ≤ 30 mN/m.

4.2 Foam stability

Foam produced according to 6.2 shall be a maximum of 50 % decomposed 10 min after preparation.

4.3 Corrosiveness

When testing the corrosion attack on steel pipe sections according to 6.3.1 the loss in mass by corrosion shall be lower than 20 mg. Leak detection solutions shall contain less than 200 mg/l halogens (F^- and Cl^-), less than 1000 mg/l sulfates (SO_4^{2-}) and shall not corrode the containers, they are filled in.

4.4 pH-value

The pH-value shall be within the range of 6 to 8.

4.5 Compatibility with non-hardening sealing materials and lubricants

Leak detection solutions shall not attack soft white paraffin jelly (white Vaseline) used for medical treatment as replacement for non-hardening sealing materials according to EN 751-2 and lubricants according to EN 377) or remove it from the metal surface when tested according to 6.5.

4.6 Flammability

The flash point determined according to 6.6 shall be higher than 55 °C.

The propellant used in spray cans shall not be flammable.

4.7 Freezing point

The freezing point of leak detection solutions for low temperature application determined according to 6.7 shall be equal or lower than -15 °C.

4.8 Toxicological harmlessness

The formulation of the leak detection solutions shall be toxicologically harmless.

5 Test samples and documentation

5.1 Test samples

The manufacturer or supplier shall submit 5 spray cans or 2 l leak detection solution in its original container(s) for the tests.

5.2 Documentation

The following documentation shall be submitted:

- a) Appropriate health and safety data sheets;
- b) Information on propellants used;
- c) Application and handling instructions.

6 Test methods

6.1 Determination of surface tension

The determination of the surface tension of leak detection solutions is performed according to ISO 304 with a platinum ring at $(20 \pm 0,5) ^\circ\text{C}$. The instrument is calibrated with double distilled water and toluene. The measured surface tension is corrected according to Harkins and Jordan by subtracting 1,9 mN/m from the measured value.

(standards.iteh.ai)

6.2 Determination of foam stability

[SIST EN 14291:2005](https://standards.iteh.ai/catalog/standards/sist/9f9cd008-5c65-44f1-bee8-3d9e4d3cd5c2/sist-en-14291-2005)

The determination of foam stability is performed according to ISO 696 but with a 250 ml measuring cylinder, 150 ml leak detection solution and at a test temperature of $(23 \pm 2) ^\circ\text{C}$. 15 ml of the leak detection solution is poured into the measuring cylinder before starting the test.

The volume of foam is registered according to ISO 696, 30 s after the solution is poured into the cylinder and again after 10 min. The foam stability is calculated as the arithmetic mean value of 3 individual determinations on samples taken from different spray cans or containers.