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**Tesnilni materiali za kovinske navojne zveze v stiku s plini 1., 2. in 3. družine ter vročo vodo - 1. del: Anaerobni tesnilni materiali**

Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water - Part 1: Anaerobic jointing compounds

Dichtmittel für Gewindeverbindungen in Kontakt mit Gasen der 1., 2. und 3. Familie und Heißwasser - Teil 1: Anaerobe Dichtmittel

Matériaux d'étanchéité pour raccords filetés en contact des gaz de la 1ère, 2ème et 3ème famille et de l'eau chaude - Partie 1: Composition d'étanchéité anaérobie

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EUROPEAN STANDARD

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English version

**Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water - Part 1: Anaerobic jointing compounds**

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This European Standard was approved by CEN on 1996-11-24. 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.

The European Standards exist 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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## Foreword

This European Standard 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 NNI.

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 June 1997, and conflicting national standards shall be withdrawn at the latest by June 1997.

This European Standard consists of the following parts:

- Part 1: Anaerobic jointing compounds
- Part 2: Non-hardening jointing compounds
- Part 3: Unsintered PTFE tapes

This European Standard 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(s).

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

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## Introduction

This European Standard specifies requirements and test methods for anaerobic jointing compounds for metallic threaded joints. These liquid, gellike or pasty sealants cure inside the gap of the threaded joint by the absence of oxygen catalysed by contact with the metal of the threaded joint. By the curing reaction, which is time and temperature dependent, a polymeric material is formed, which fills the gap and micro-imperfections of the thread and binds strongly to the metal surfaces thus sealing and bonding the threaded joint.

Anaerobic jointing compounds can be formulated to harden to different strength levels. Users of such materials should therefore consult the manufacturers information to ensure that the grade is suitable for the application e.g. the size of the thread, the materials of the joints, and whether the joint needs to be dismantled.

Since not only the mechanical strength of the threaded joint but also the sealing properties of the anaerobic sealing material are influenced by the preparation of the threads and other factors, the application instructions provided by the manufacturer of the sealing material should be followed. It is important that only "Competent Persons" should be working on gas installations.

For applications outside the scope of this Standard the manufacturer should be consulted prior to use.

It is important to note that threaded joints once finally assembled should never be adjusted. Where it proves necessary to dismantle the joints, they should be unscrewed completely, cleaned and assembled once again using fresh jointing compound.

A universally applicable jointing compound may be used for all gas, potable water, and hot water installation.

In respect of potential adverse effects of the jointing compounds covered by this European Standard on the quality of water intended for human consumption this Standard provides no information as to whether the jointing compounds may be used without restriction in any of the Member States of the EU or EFTA. The use and characteristics of the jointing compounds should comply with current regulations, where they exist, depending on the acceptance of verifiable European criteria.

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## 1 Scope

This European Standard specifies requirements and test methods for anaerobic jointing compounds (hereafter referred to as "jointing compounds") suitable for sealing threaded metallic joints such as those specified in ISO 7-1. These jointing compounds are for use in contact with 1st family gases (town gas), 2nd family gases (natural gas) and 3rd family gases (liquefied petroleum gases (LPG) not including LPG in the liquid form) and hot water of heating systems according to table 1.

**Table 1: Application of anaerobic jointing compounds**

Fluid	Temperature range °C	Pressure-limit bar	Typical application
1st, 2nd, 3rd family gases <sup>1)</sup>	-20 to 125	5	gas appliances gas equipment installation
hot water <sup>2)</sup>	up to 130	7	heating systems
<p>1) Some jointing compounds can be used for other applications. For such applications, which are outside the scope of this European Standard, the purchaser should consult the manufacturer.</p> <p>2) Sealing properties and mechanical strength are influenced by various factors such as nature of metal, form, roughness and size of thread, cleanness of the joint from cutting oil, etc. Non-hardening sealing materials in form of e.g. jointing compounds paste are covered by EN 751-2 and in form of PTFE-tapes are covered by EN 751-3.</p>			

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO 7-1	<i>Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation</i>
ISO 228-1	<i>Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation</i>
EN ISO 2160	<i>Petroleum products - Corrosiveness to copper - Copper strip test (ISO 2160:1985, including Corrigendum 1:1993)</i>
EN 437	<i>Test gases - Test pressures - Appliance categories</i>
EN 10242	<i>Threaded pipe fittings in malleable cast iron</i>

prEN 10255 *Carbon steel tubes suitable for welding or threading*prEN 12164 *Copper and copper alloys - Rod for free machining purposes*

### 3 Definitions

For the purposes of this European Standard the following definitions apply:

**3.1 anaerobic jointing compound** (referred to hereafter as jointing compound) : Sealing material applied as a liquid, gel or paste to the threads (without the addition of sealant supporting bases) which cures inside the gap of the threaded joint in the absence of oxygen and catalysed by metal ions.

**3.2 gas family** : For further information on types of gases see EN 437.

**3.3 batch** : Any quantity of jointing compound manufactured in a single mix at one time.

### 4 Classification of jointing compounds

There are two classes of anaerobic jointing compounds suitable for fine (I) and coarse (H) threads according to table 2.

**Table 2: Classification of anaerobic jointing compounds**

Class	Thread	Nominal Size
I	ISO 7-1 taper/parallel and taper/taper	DN ≤ 10 <sup>1)</sup>
H	ISO 7-1 taper/parallel and taper/taper	10 < DN ≤ 50

1) Class I anaerobic jointing compounds may also be used for other dimensions when the number of turns of the thread is  $\geq 7,5 \text{ cm}^{-1}$ .

### 5 Requirements

#### 5.1 Requirements to be met by the jointing compound as received

##### 5.1.1 Visual quality

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The jointing compound shall be of a homogenous liquid to pasty consistency easily applicable to threads. It shall also be free of lumps or other deleterious materials when tested in accordance with the method described in 7.1.1.



### 5.1.2 Chemical stability

The jointing compound shall have a gel time not less than 5 min at 100 °C when tested in accordance with the method described in 7.1.2.

### 5.1.3 Corrosive properties

The jointing compound shall not cause corrosion of aluminium, brass, copper, low carbon steel or zinc surfaces when tested in accordance with 7.1.3. The appearance of copper and brass test strips shall give a classification 3 or less in accordance with ISO 2160.

### 5.1.4 Storage properties

The storage life of the jointing compound shall be at least one year in its original unopened container when stored at a temperature less than 25 °C, indicated and declared by the manufacturer.

## 5.2 Requirements to be met by the jointing compound after assembly

### 5.2.1 Sealing properties

When tested in accordance with the methods described in 7.2.1 the jointing compound shall not disintegrate or flow out of the joint and shall not permit any leakage when each test assembly is tested in accordance with 7.2.1.2 to 7.2.1.6 in sequence.

#### 5.2.1.1 Soundness

When pressurised within 1 h after preparation all the joints in the test assemblies shall not leak when tested in accordance with 7.2.1.2.

#### 5.2.1.2 Resistance to gas condensates

The sealing properties of the jointing compound shall not be impaired by liquid hydrocarbon gas condensate when tested in accordance with 7.2.1.3.

#### 5.2.1.3 Resistance to hot water

The sealing properties of the jointing compound shall not be impaired by hot water when tested in accordance with 7.2.1.4. [SIST EN 751-1:1997](https://standards.iteh.ai/catalog/standards/sist/f1cb2922-47e2-43b6-81b3-28164c08bf2/sist-en-751-1-1997)

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#### 5.2.1.4 Resistance to temperature cycling

The sealing properties of the jointing compound shall not be impaired by temperatures of  $-(20 \pm 2)$  °C and  $(150 \pm 2)$  °C when tested in accordance with 7.2.1.5.