



# SLOVENSKI STANDARD SIST EN 12514-2:2003

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Installations for oil supply systems for oil burners - Part 2: Safety requirements and tests  
- Parts, valves, pipes, filters, oil de-aerators, meters

Ölversorgungsanlagen für Ölbrenner - Teil 2: Sicherheitstechnische Anforderungen und  
Prüfungen - Bauelemente, Armaturen, Leitungen, Filter, Heizöentlüfter, Zähler

Installations des systemes d'alimentation de fioul pour les bruleurs de fioul domestique -  
Partie 2: Prescriptions de sécurité et essais - Composants, vannes, conduites, filtres,  
dégazeurs de fioul domestique, compteurs

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EUROPEAN STANDARD

EN 12514-2

NORME EUROPÉENNE

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## Installations for oil supply systems for oil burners - Part 2: Safety requirements and tests ; Parts, valves, pipes, filters, oil de-aerators, meters

Installations des systèmes d'alimentation de fioul pour les brûleurs de fioul domestique - Partie 2: Prescriptions de sécurité et essais ; Composants, vannes, conduites, filtres, dégazeurs de fioul domestique, compteurs

Ölversorgungsanlagen für Ölbrenner - Teil 2: Sicherheitstechnische Anforderungen und Prüfungen ; Bauelemente, Armaturen, Leitungen, Filter, Heizöflüfter, Zähler

This European Standard was approved by CEN on 21 July 1999.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 47 "Atomizing oil burners and their components - Function - Safety - Testing", the secretariat of which is held by DIN.

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 September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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## 1 Scope

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This standard applies to parts, valves, pipes, filters, oil de-aerators and meters of oil supply installations for automatic supply of one or more oil burners or oil consuming units with light fuel oil (maximum viscosity of 10 mm<sup>2</sup>/s at a temperature of 20 °C) from one or more central storage tanks under static or dynamic pressure. This standard covers all the above mentioned components between the connection to one or more tanks and the connection to oil burners or oil consuming units, including the direct series-connected shut-off devices. EN 12514-1 covers technical safety requirements and tests for parts, oil feed pumps, control and safety devices and oil supply tanks.

This standard specifies the safety requirements and corresponding tests for all parts, valves, pipes, filters, oil de-aerators and meters within an oil supply installation.

## 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 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.

EN 12514-1

Installations for oil supply systems for oil burners - Part 1: Safety requirements and tests; Parts, oil feed pumps, control and safety devices, supply tanks

EN 60335-1

Safety of household and similar electrical appliances - Part 1: General requirements (IEC 60335-1 : 1991, modified)

EN 60529

Degrees of protection provided by enclosures (IP-Code) (IEC 60529 : 1989)

EN ISO 6806

Rubber hoses and hose assemblies for use in oil burners - Specification (ISO 6806 : 1992)

ISO 228-1

Pipe threads where pressure-tight joints are not made on the thread - Part 1: Dimensions, tolerances and designation

### 3 Definitions

For the purposes of this standard the following definitions apply:

**3.1 shut-off valve:** device to shut-off and release the flow in oil pipes.

Depending on their type, these can be for example valves, slide valves, cocks, butterfly valves.

**3.2 quick-acting shut-off valve:** device to shut-off and release the flow in oil pipes by short-stroke or maximum 90° rotation by hand or automatically.

**3.3 reversing valve:** device in oil pipes to shut-off or release one of several flow inlets to one flow outlet individually.

**3.4 forced reversing valve:** device in oil pipes with several forward-flow inlets and corresponding return outlets and with one or more forward-flow outlets and corresponding return inlets.

**3.5 non-return valve:** device to release the flow in oil pipes in flow direction and to shut-off in reverse direction automatically.

**3.6 pressure compensating device:** device to limit the pressure increase in closed pipe sections due to temperature depending volume changes of the fuel oil.

**3.7 relief valve:** device to limit the pressure to a predetermined maximum pressure value.

**3.8 oil pressure controller:** device to keep the supply pressure constant within the preset limits independently of fluctuations of initial pressure and changes of volume flow.

**3.9 filter:** device to retain solid matter of a specified minimum size out of the pumped fuel oil.

**3.10 meter:** device for the volumetric measurement of fuel oil.

**3.11 oil de-aerator:** device for automatic bleeding of gas and air from oil pipes.

**3.12 protective siphon valve:** mechanically or electromagnetically actuated valve to prevent siphoning of the oil tank automatically.

**3.13 other components:** components according to the scope stated in clause 1 and not defined in 3.1 to 3.12.

### 4 Safety requirements

#### 4.1 Material and construction requirements

The quality of the material as well as type and dimensioning of components shall ensure the continuous safe operation and an adequate service life of the components forming part of the oil supply system, provided they are installed in accordance with the Good Practice and treated as required in the manufacturer's conditions for operation, maintenance and adjustment, and they shall be resistant against the mechanical, chemical and thermal stresses imposed under operational conditions.

Test according to 5.4.1 and 5.4.2.

#### 4.2 Pressure resistance

All components subjected to pressure shall be capable of withstanding 1,3 times the maximum allowed operating pressure, but at least an overpressure of 6 bar.

Test according to 5.4.6.

#### 4.3 Temperature range

Components according to this standard shall operate without failure in an oil temperature range between 0 °C and 40 °C.

#### 4.4 Pipe connections

Components with threaded connections shall have a metric ISO-thread or a pipe-thread according to ISO 228-1, at least four complete (carrying) turns and flats for spanner or other suitable holding means to meet the necessary torque to obtain leaktightness.

Pipe connections (screws, flanges or soldered connections) and the seals used shall meet the requirements of 4.1 and shall be leaktight.

Test according to 5.4.1, 5.4.2 and 5.4.5.1.

NOTE: Flanges should be designed according to ISO 7005-1.

#### 4.5 Flow resistance

Under test conditions specified in 5.4.4.1 (measuring results  $\times 1,5$ ), the differential pressure shall not exceed 50 mbar except for reversing valves in accordance with 4.9, forced reversing valves in accordance with 4.10 and non-return valves in accordance with 4.11 where the differential pressure shall not exceed 100 mbar.

If any components are integrated in one construction unit, e. g. filter and shut-off valve, this requirement is considered as met, if the differential pressure of the unit does not exceed  $n \times 50$  mbar or  $n \times 100$  mbar respectively.

Test according to 5.4.4.2.

#### 4.6 Leaktightness

All components specified in accordance with this standard shall be leaktight from inside and outside.

Test according to 5.4.5.

#### 4.7 Shut-off valve

The shut-off valve shall be leaktight in the closed position.

Test according to 5.4.1, 5.4.3 and 5.4.5.1.

#### 4.8 Quick-acting shut-off valve

The quick-acting shut-off valve shall be tight in the closed position and shall only allow a completely opened or closed position, but no intermediate position.

The opened or closed position shall be visible.

Test according to 5.4.1, 5.4.3 and 5.4.5.1.

#### 4.9 Reversing valve

The outlet of the reversing valve shall be connected only with one inlet and shall be leaktight against the other inlet.

The respective adjusted position shall be visible.

Test according to 5.4.1, 5.4.3 and 5.4.5.1.

#### 4.10 Forced reversing valve

The forced reversing valve shall be adjustable only in a way where on the inlet side only one adjoined outlet connection (e. g. return flow) is opened for the flow from each adjustable inlet connection (e. g. forward flow).

The respective position shall be visible and be protected against unintentional adjustment (e. g. by engaging).

Test according to 5.4.1, 5.4.3 and 5.4.5.1.

#### 4.11 Non-return valve

The non-return valve shall prevent the decrease of the oil column. Non-return valves with a distance pin (foot valves) shall be designed in such a way that a distance of at least 50 mm is ensured between the tank bottom and the inlet opening of the non-return valve. The distance pin shall neither damage the tank bottom mechanically nor cause a contact corrosion with the tank bottom.

Test according to 5.4.1, 5.4.2 and 5.4.5.2.

#### 4.12 Pressure compensating device

The pressure compensating device shall compensate for changes of the oil volume in a closed pipe section in the temperature range of 40 K.

Test according to 5.4.3 and 5.4.7.

#### 4.13 Overflow valve

The overflow valve shall prevent an excess of the preset pressure. It shall open at a specified inlet pressure and remain in the open position when a predetermined inlet pressure is reached.

For adjustable overflow valves, the adjusted values shall be readable (e. g. through a pressure gauge). Its adjustment shall not change automatically and shall only be possible by means of tools. An unauthorized adjustment shall be visible (e. g. protection by a lacquer layer or a seal).

A connection for a return pipe shall be provided for safe discharge of the overflowing oil.

Test according to 5.4.1 and 5.4.3.

#### 4.14 Oil pressure controller

An oil pressure controller preset at a fixed pressure by the manufacturer shall ensure an output pressure between 0,1 bar and 0,3 bar for a supply pressure between 0,5 bar and 4,0 bar.

Adjustable oil pressure controllers shall be adjustable, at a supply pressure between 0,5 bar and 4,0 bar and within the adjustment range stated by the manufacturer, to ensure an output pressure between 0,1 bar and 0,3 bar.

If this adjustment range is exceeded or not reached, the range of the output pressure shall be indicated in the capacity diagram or sheet.

The proper functioning of preset (fixed pressure) and adjustable oil pressure controllers shall be ensured within the range of flow rate stated by the manufacturer.

Test according to 5.4.8.

#### 4.15 Filter

The filter shall meet the requirement of 4.5, if 50 % of the filter surface are covered. A filter that can be opened shall be vacuum-tight when closed again. The filter shall retain solid matters of a grain size  $> 0,2$  mm.

Test according to 5.4.3, 5.4.4.2 and 5.4.5.3.

#### 4.16 Meter

If a counter is employed for account calculations subject to calibration regulations, it shall be checked periodically by national test laboratories.

Test according to 5.4.1.

#### 4.17 Hoses

Hoses and hoses with a textile coating shall comply with the requirements of EN ISO 6806. The test with the Bunsen burner is not required.

Test according to 5.4.1.

#### 4.18 Oil de-aerator

The oil de-aerator shall be capable of venting at least four liters of air/gas per hour out of the fuel oil. In order to ensure a maximum safety, it shall be provided with at least two level controllers and air throttles with independent operation.

The oil de-aerator shall be constructed in a way that it does not block the return of the oil. This is to prevent an overpressure in the system that is detrimental for the exposed components.

Test according to 5.4.3, 5.4.4.2 and 5.4.5.3.

#### 4.19 Protective siphon valves

They shall be appropriate for their intended use.

### 5 Test methods

#### 5.1 Evaluation of conformity

The tests by a test laboratory shall be executed according to 5.2.1 to 5.2.5.

#### 5.2 Kinds of tests

##### 5.2.1 Type test

A type test is a test commissioned by the manufacturer to determine the compliance of a device with the requirements of this standard. The tests apply to all components of the device.

The type test may also be performed as part test, supplementary test or test of the drawings according to 5.2.2 to 5.2.4.

##### 5.2.2 Component test

Test that refers to one or more components of a type tested device.

##### 5.2.3 Supplementary test

Test for determining the influence of a modification (e. g. an additional component) on a device that was already type tested.

Components that are not influenced by the modification need not to be tested.

##### 5.2.4 Test of the drawings

Test for determining whether a modified device is in conformance with the type tested model with regard to its performance and application range (requirements according to section 4).

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##### 5.2.5 Type recheck [https://standards.iteh.ai/catalog/standards/sist/d33aacc8c-ca8f-4695-b6f3-](https://standards.iteh.ai/catalog/standards/sist/d33aacc8c-ca8f-4695-b6f3-f6d39b618359/sist-en-12514-2-2003)

Samples that cannot be tested in the test laboratories by their design (e. g. size) may also be tested according to 5.2.1 to 5.2.5 by the test laboratory in the manufacturer's facilities. The manufacturer shall provide the necessary test equipment.

#### 5.3 Test samples and test documents

##### 5.3.1 Test samples

For type testing, the manufacturer provides for the test laboratory one or more test samples. The place of sampling and the number of samples are determined by the test laboratory.

##### 5.3.2 Test documents

The following documents shall be submitted in duplicate:

- a) Compilation, section and workshop drawings in durable material (e. g. blueprints) with date and legally binding signature.

The drawings including necessary section drawings shall give a clear picture of the design of the test sample and of all its essential parts;

- b) installation, maintenance and operation instructions or corresponding drafts;
- c) photo of the test sample;

d) description of the test sample and its essential components as far as necessary for good understanding, with the following information:

- materials or their analysis;
- surface protection treatment;



- dimensions in mm and the dimensions for the connections, which may also be stated in the drawings (see paragraph a).
- e) the manufacturer's certificate that the electrical equipment as well as possible electronic devices comply with EN 60335-1;
- f) if appropriate, certificates of tests already performed on the sample.

## 5.4 Test procedure

### 5.4.1 Visual test

This test shall be performed on the sample according to 5.3.1 and 5.3.2.

### 5.4.2 Dimensional test

This test shall be performed by remeasuring the test sample according to 5.3.1 and by means of the drawings according to 5.3.2.

### 5.4.3 Temperature test and functional test

The operation shall be tested on one of the test samples; the test fluid is light fuel oil with an oil temperature of  $(40 \pm 2)$  °C. It is to be observed whether the test sample functions properly at this temperature. The test is carried out under the pressure allowed for this component.

### 5.4.4 Test of flow resistance

#### 5.4.4.1 set-up of measuring instruments

A measuring device according to figure 1 shall be used for measuring the differential pressure. The measuring tubes and measuring heads shall be designed according to figures 2 and 3. For dimensions and volume flow, see tables 1 and 2.

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#### 5.4.4.2 Test procedure

The figures in brackets refer to the position numbers in figure 1.

According to figure 1 three test samples (6) shall be installed one after the other between the measuring head (5) at the inlet side corresponding to their nominal width and the connected measuring tube (7). The pressure gauge for the differential pressure (8) is then to be connected with the measuring heads (5).

After venting the test equipment properly the test is carried out with water at a temperature of  $(20 \pm 2)$  °C. By means of the shut-off valves (2), the volume flow shall be adjusted to the values in table 1 for the measuring head.

After 2 min operating time, the differential pressure is read from the differential pressure gauge (8). The test is repeated three times on each test sample.

When testing filters, 50 % of the filter surface shall be covered.

The requirement is considered as met, if the mean value of the indicated differential pressure for the 9 test results, multiplied by 1,5, does not exceed 100 mbar for reversing valves according to 3.3, forced reversing valves according to 3.4 and non-return valves according to 3.5. For all other devices, this value shall not exceed 50 mbar.