# SLOVENSKI STANDARD
# SIST EN 16882:2017

**01-februar-2017**

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**Cestna vozila - Varnost mehanskih tesnil na tahografih - Zahteve in postopki preskušanja**

Road vehicles - Security of the mechanical seals used on tachographs - Requirements and test procedures



Véhicules routiers - Sécurité des scellés mécaniques utilisés sur des chronotachygraphes - Exigences et procédures d'essais



**Ta slovenski standard je istoveten z:** **EN 16882:2016**

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**ICS:**

| | | |
|---|---|---|
| 43.040.30 | Prikazovalne in kontrolne naprave | Indicating and control devices |

**SIST EN 16882:2017** **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 16882

November 2016

ICS 43.040.30

English Version

# Road vehicles - Security of the mechanical seals used on tachographs - Requirements and test procedures

Véhicules routiers - Sécurité des scellés mécaniques utilisés sur des chronotachygraphes - Exigences et procédures d'essais

Straßenfahrzeuge - Sicherheit von mechanischen Siegeln für Tachographen - Anforderungen und Testmethoden

This European Standard was approved by CEN on 18 October 2016.

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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 CEN-CENELEC Management Centre has the same status as the official versions.



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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## European foreword

This document (EN 16882:2016) has been prepared by Technical Committee CEN/TC 301 “Road vehicles” and its working group WG10, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by May 2017, and conflicting national standards shall be withdrawn at the latest by May 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association: M/502 Mandate to CEN, CENELEC and ETSI concerning standardization within the context of Regulation No. 3821/85 on recording equipment in road transport, for purpose of developing seals for digital tachographs.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## 1 Scope

This European Standard is intended to provide technical specifications for mechanical seals to enhance the security of digital tachograph systems. It applies to the category of vehicles as defined in European Regulation n°165/2014.

NOTE 1 This European Standard is primarily intended to digital tachographs but can be applied to analog tachographs.

NOTE 2 Any type of seals which meet the requirements within this European Standard can be used.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

DIN 52348, *Testing of glass and plastics; abrasion test; sand trickling method*

EN 60068-2-6, *Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal) (IEC 60068-2-6)*

EN 60068-2-14, *Environmental testing - Part 2-14: Tests - Test N: Change of temperature (IEC 60068-2-14)*



EN 60068-2-30, *Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle) (IEC 60068-2-30)*



EN 60068-2-38, *Environmental testing - Part 2-38: Tests - Test Z/AD: Composite temperature/humidity cyclic test (IEC 60068-2-38)*

EN ISO 105-X12, *Textiles - Tests for colour fastness - Part X12: Colour fastness to rubbing (ISO 105-X12)*

IEC 60068-2-64:2008, *Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance*

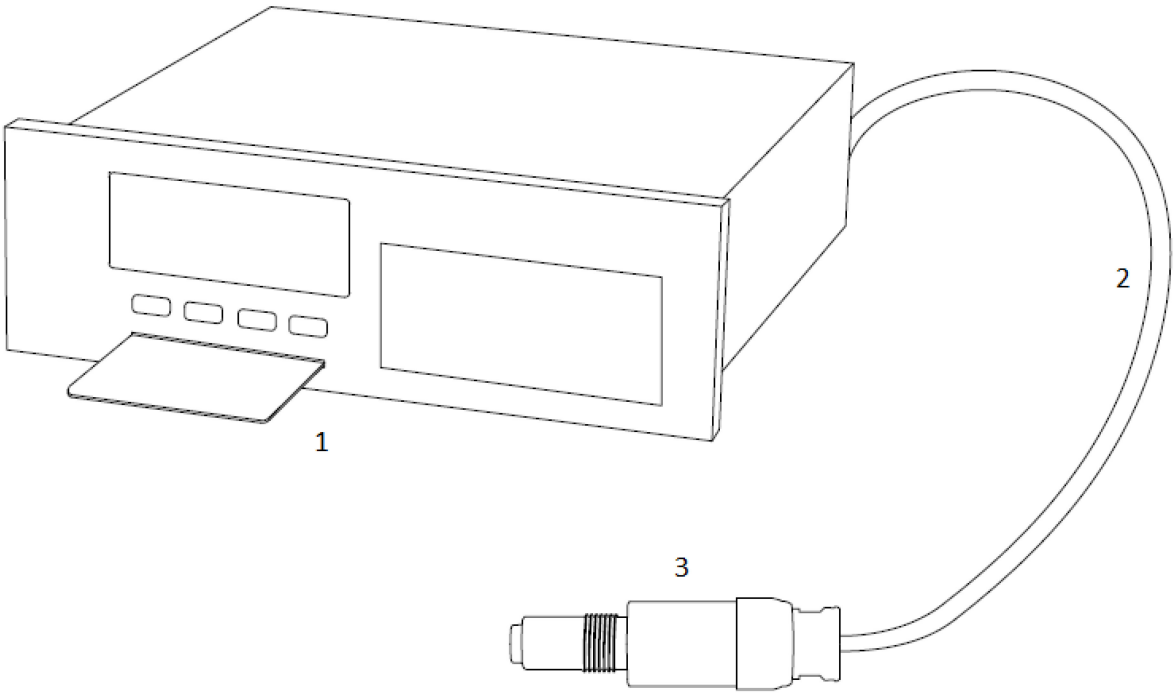
ISO 16750-5:2010, *Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 5: Chemical loads*

Regulation EU (No) 165/2014 of the European Parliament and of the Council of 4 February 2014 on tachographs in road transport, repealing Council Regulation (EEC) No 3821/85 on recording equipment in road transport and amending Regulation (EC) No 561/2006 of the European Parliament and of the Council on the harmonization of certain social legislation relating to road transport

## 3 Terms and definitions

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

**3.1**
**tachograph system**
chain of following components (as defined in Figure 1): vehicle unit, cabling, and motion sensor




**Key**

1 vehicle unit
2 cabling
3 motion sensor



**Figure 1 — Tachograph system**



**3.2**
**tachograph or recording equipment**
equipment intended for *installation* in road vehicles to display, record, print, store and output automatically or semi-automatically details of the movement, including the speed, of such vehicles, and details of certain periods of activity of their drivers

**3.3**
**motion sensor**
part of the tachograph providing a signal representative of vehicle speed and/or distance travelled

**3.4**
**vehicle unit**
tachograph excluding the motion sensor and the cables connecting the motion sensor

Note 1 to entry: The vehicle unit may be a single unit or several units distributed in the vehicle, provided that it complies with the security requirements of Regulation 165/2014; the vehicle unit includes, among other things, a processing unit, a data memory, a time measurement function, two smart card interface devices for driver and co-driver, a printer, a display, connectors and facilities for entering the user's inputs.

**3.5**
**seal**
mechanical device marked with a unique identifier and designed for a single use, which is externally affixed to the gearbox and the sensor, and other possible sensitive part as defined on the tachograph type approval, and is designed to show visual evidence of tampering or intrusion to the system

Note 1 to entry: In certain configuration, a seal can be composed of different parts to fulfill its aim, as for example, a closing device and a wire.

Note 2 to entry: Seals need to be designed and constructed so that tamper attempts create and leave evidence of that tampering.

Note 3 to entry: All grades and types of seals require inspection to indicate whether tampering has occurred.

**3.6**
**defeated seal**
seal which has been opened or removed and replaced or reconstructed without detectable evidence of tampering

**3.7**
**seal tampering**
attempt to open, remove, replace or reconstruct a seal

**3.8**
**tamper evidence**
irreversible tell-tale indication that an attempt has been made to open, remove, replace or re-construct the seal

Note 1 to entry: It's a mechanical variation obvious and irreversible.

Note 2 to entry: It can't be considered as tamper evidence a modified part of the product, which can recover its initial state by applying an external physical source.



Note 3 to entry: Examples of tamper evidence include a change in the colour of the material, in surface texture, cracks, indentations, abrasions, etc.



Note 4 to entry: Tamper evident indicators are recognizable by normal examination under the usual circumstances prevailing in practice without technical aids (such as a magnifying glass or microscope).

**3.9**
**tampered seal**
opened, removed, replaced or reconstructed seal with tamper evidence

**3.10**
**indicativeness**
ability to reveal evidence after attempts have been made to tamper with the seal

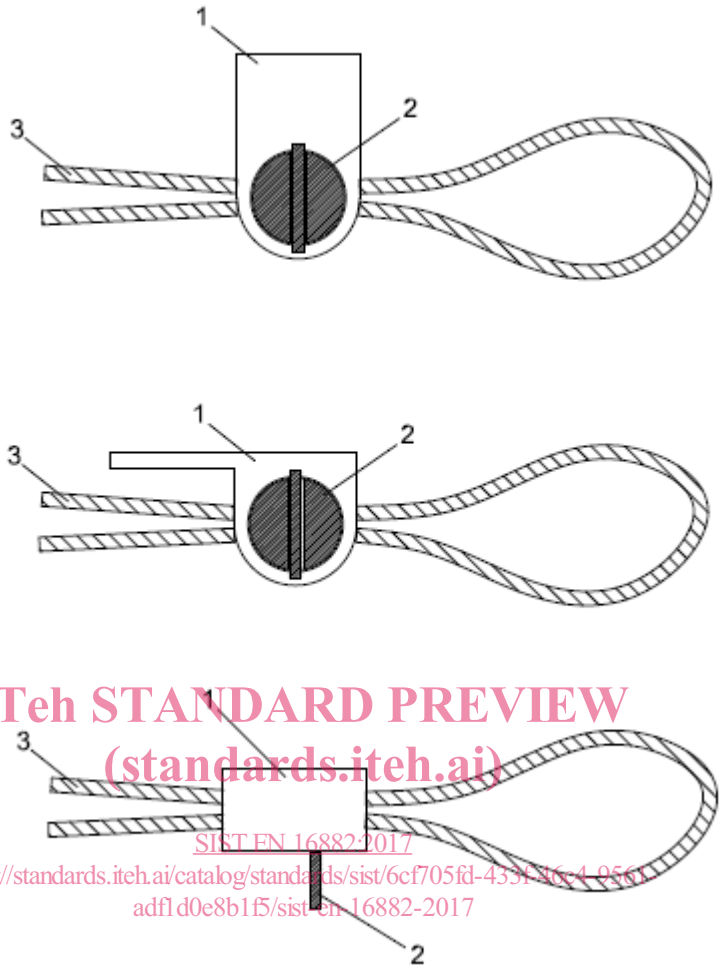
**3.11**
**wire seal**
length of wire secured in a loop by some type of seizing device

EXAMPLE Wire seals include: crimp wire, fold wire and cup wire seals.

Note 1 to entry: The seizing device can be plastic or metal and its deformation is one indication of tampering.

**3.12**
**rotating seal**
formed by at least two elements: the main body and the rotating element

Note 1 to entry: The internal mechanism rotates on its axis without auxiliary tools within the main body in one direction engaging and retaining the two wire ends.

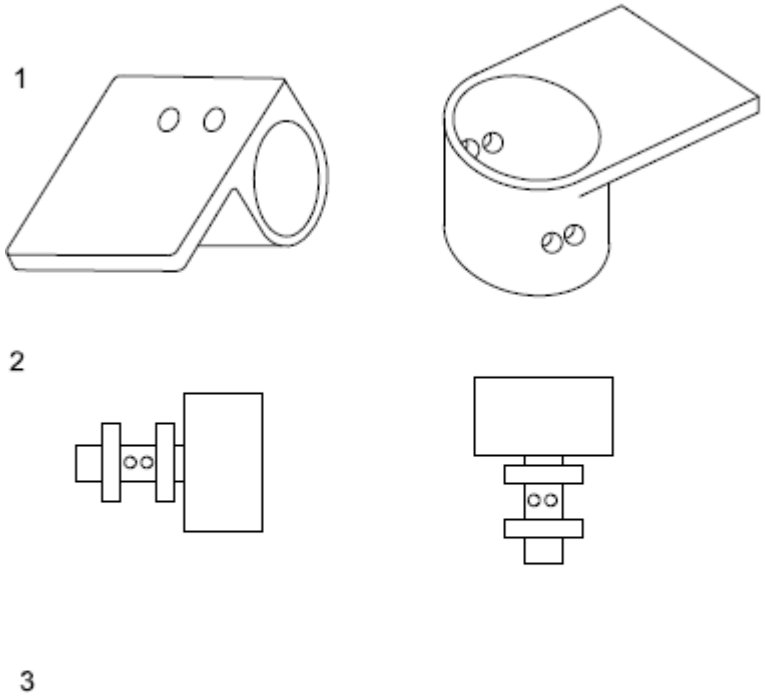





**Key**

1 main body
2 rotating element
3 wire

**Figure 2 — example of rotating seal**






**Key**

1 main body
2 rotating element
3 wire

**Figure 3 — example of detailed parts for a rotating seal**

**3.13**
**tail seal**
metal or plastic strap secured in a loop by inserting one end into or through a protected (covered) locking mechanism on the other end

Note 1 to entry: The seizing device can be plastic or metal and its deformation is one indication of tampering.

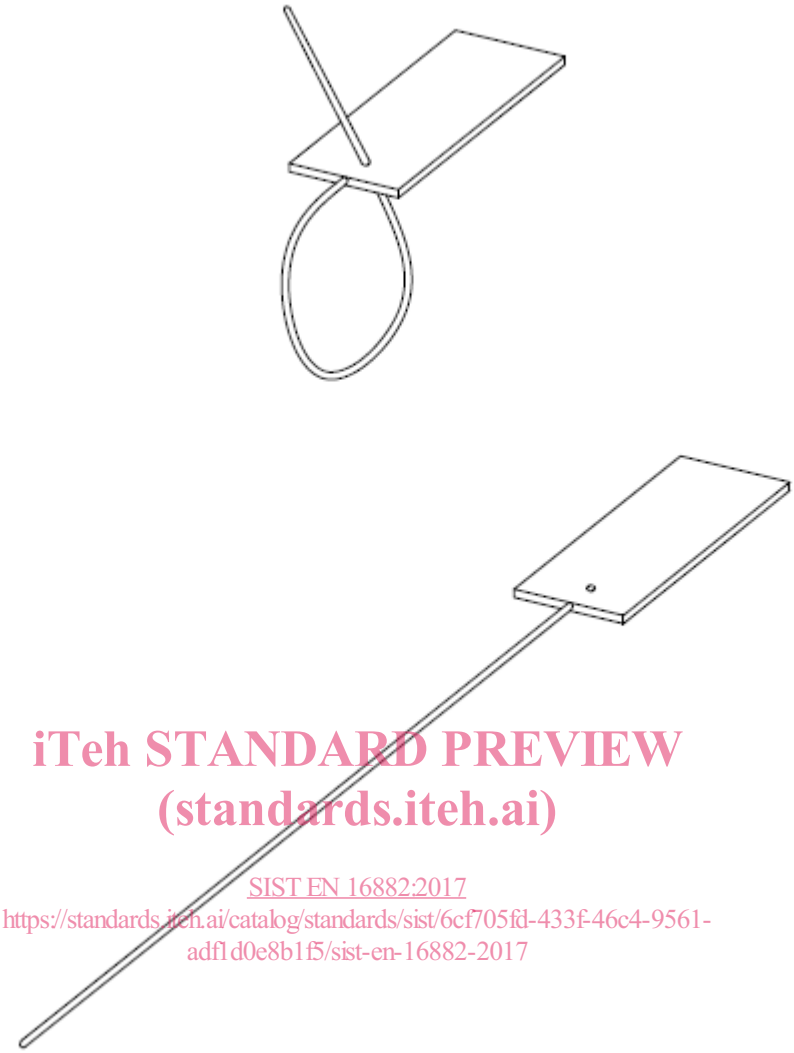




**Figure 4 — example of tail seal**

**3.14**
**security label seal**
paper or plastic backing with adhesive that gives visual evidence of tampering

# 4 Seal Requirements

## 4.1 General

These requirements shall be applied to any type of seal.

The marking requirements are given in Clause 7.

All seals should be easy to fit correctly on the item to be sealed and, once *in situ*, be easy to check for correct fitment and integrity. Correct handling and fitting of seals is at least equal if not greater in importance than selection of the correct seal. A poorly chosen but correctly fitted seal may provide security; however, a well-chosen but incorrectly fitted seal will provide no security.

Seals shall be sufficiently durable, strong, and reliable so as to prevent accidental breakage and early deterioration (due to environmental conditions, chemical action, vibration, shock, etc.) in normal use.

All types of seals shall be capable of being affixed quickly.

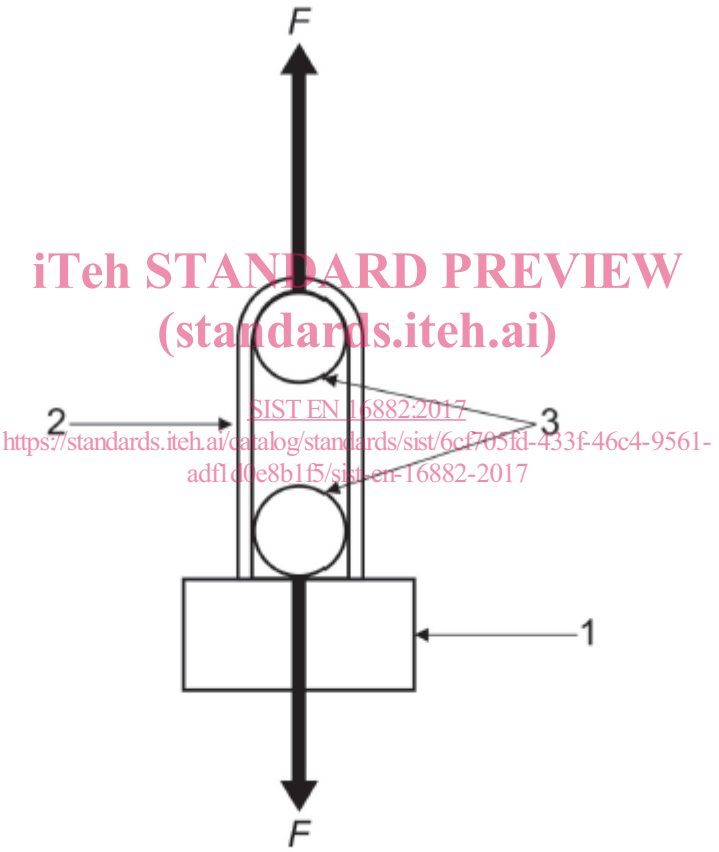
Tachographs seals are typically subjected to the harsh environments of road transport industries. Sand and dust, salt spray, grease, snow, ice and grime can be expected to coat the seal. Physical shock and vibration are commonly encountered as a result of handling and transport operations.

Mechanical seals shall be constructed to be fit for their intended purposes.

## 4.2 Requirements to traction

### 4.2.1 First requirement (for the system composed by the wire and the seal)

As shown in Figure 5, a value of 13 kg has to be applied in the longitudinal direction and the seal shall not break.






**Key**

1 locking mechanism of the seal
2 wire
3 pin
*F* applied pull force

**Figure 5 — Traction test for system composed by the the wire and the seal**