



SLOVENSKI STANDARD
oSIST prEN 16882:2015
01-september-2015

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

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

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Ta slovenski standard je istoveten z: prEN 16882

ICS:

43.040.30

Prikazovalne in kontrolne
naprave

Indicating and control
devices

oSIST prEN 16882:2015

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 16882

June 2015

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

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

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European foreword

This document (prEN 16882:2015) has been prepared by Technical Committee CEN/TC 301 “Road vehicles” and its working group CEN TC301/WG10, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

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.

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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: Color 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 harmonisation of certain social legislation relating to road transport

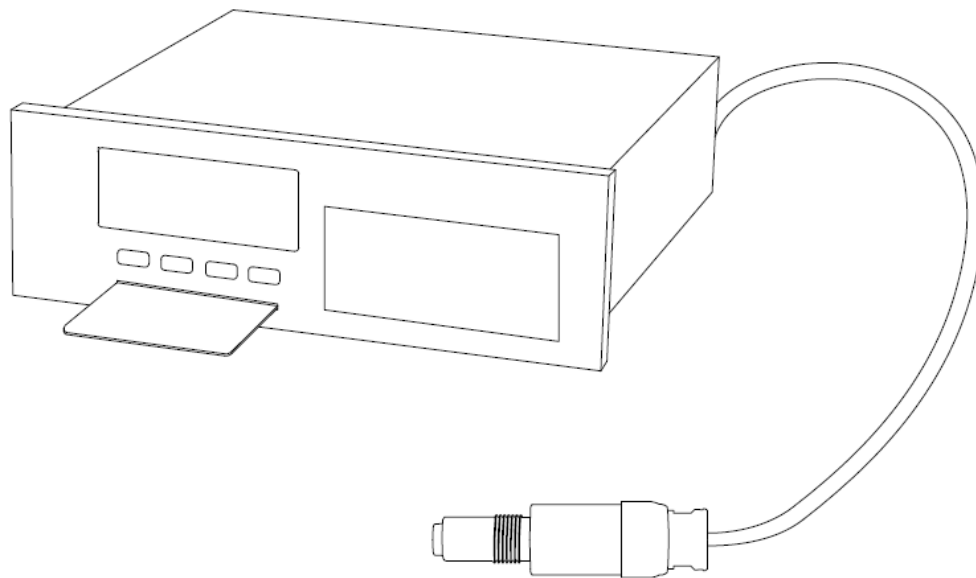
3 Terms and definitions

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.

prEN 16882:2015 (E)**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 color 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

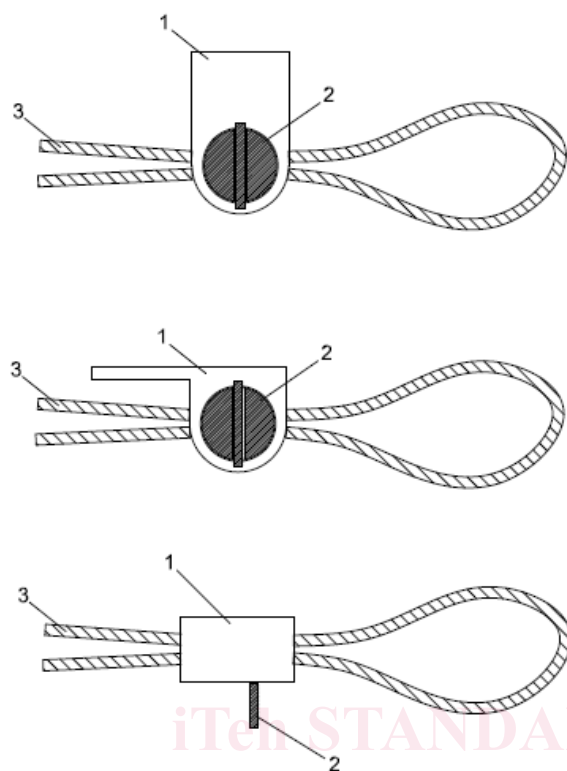
EXAMPLE Wire seals include: crimp wire, fold wire and cup wire seals.

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.

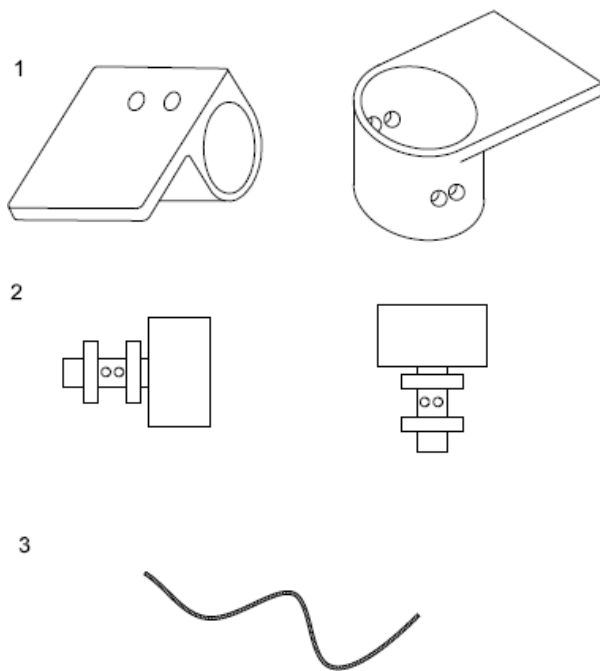
**Key**

1 main body

2 rotating element

3 wire

Figure 2 — example of rotating seal

**Key**

- 1 main body
- 2 rotating element
- 3 wire

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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.

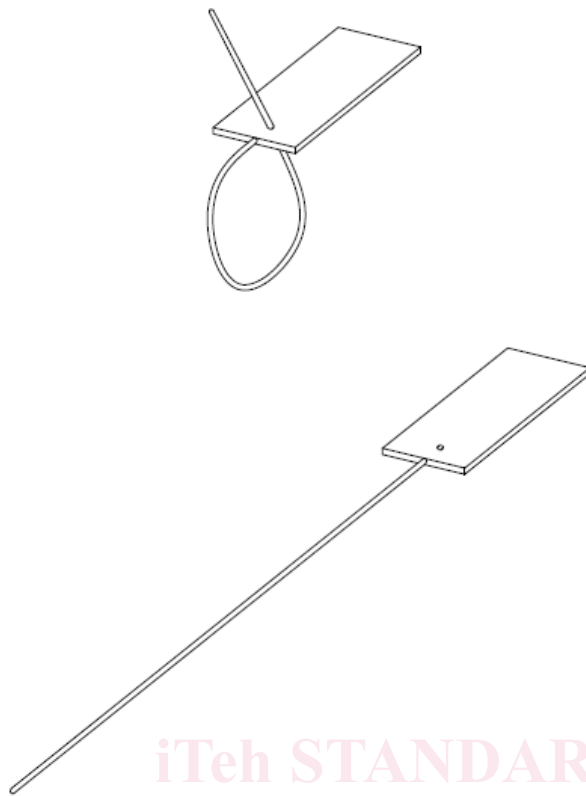


Figure 4 — example of tail seal

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.

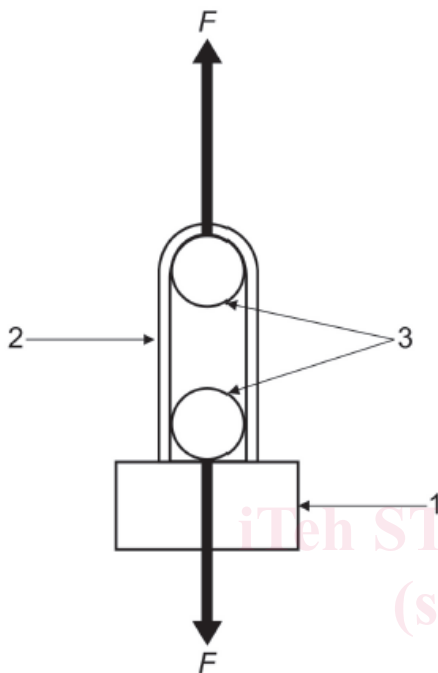
Tachographs seals are typically subjected to the harsh environments of road transport industries. Sand and dust, salt spray, grease, snow, ice and grime can be expected to coat the seal. Physical shock and vibration are commonly encountered as a result of handling and transport operations.

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

4.2.2 Second requirement

At a higher power, the seal or the wire shall brake before the opening of the seal in order to show the tampering evidence: the load shall be slowly applied until the seal forcibly opens or is otherwise broken.

On different application points shown in Figure 6, when the parts are assembled, the seal shall not permit the rotation of the sensor more than 90°.