

# SVENSK STANDARD

## SS-EN 13802:2013



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### **Järnvägar – Upphängning – Hydrauliska dämpare**

### **Railway applications – Suspension components – Hydraulic dampers**

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Denna standard ersätter SS-EN 13802:2004, utgåva 1.

The European Standard EN 13802:2013 has the status of a Swedish Standard. This document contains the official version of EN 13802:2013.

This standard supersedes the Swedish Standard SS-EN 13802:2004, edition 1.

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EUROPEAN STANDARD

**EN 13802**

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2013

ICS 45.040

Supersedes EN 13802:2004

English Version

## Railway applications - Suspension components - Hydraulic dampers

Applications ferroviaires - Eléments de suspension -  
Amortisseurs hydrauliques

Bahnanwendungen - Federungselemente - Hydraulische  
Dämpfer

This European Standard was approved by CEN on 5 October 2013.

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| <b>Contents</b>                                                                                    | <b>Page</b> |
|----------------------------------------------------------------------------------------------------|-------------|
| Foreword.....                                                                                      | 4           |
| <b>1 Scope .....</b>                                                                               | <b>6</b>    |
| <b>2 Normative references .....</b>                                                                | <b>6</b>    |
| <b>3 Terms, definitions and symbols .....</b>                                                      | <b>6</b>    |
| 3.1 Terms and definitions .....                                                                    | 7           |
| 3.2 Symbols .....                                                                                  | 8           |
| <b>4 Method of specifying .....</b>                                                                | <b>14</b>   |
| 4.1 Overview .....                                                                                 | 14          |
| 4.1.1 General.....                                                                                 | 14          |
| 4.1.2 Operational environment .....                                                                | 14          |
| 4.1.3 Technical requirements .....                                                                 | 14          |
| 4.2 Operational environment requirements .....                                                     | 16          |
| 4.2.1 Service conditions .....                                                                     | 16          |
| 4.2.2 Climatic conditions.....                                                                     | 16          |
| 4.2.3 Special environmental conditions .....                                                       | 17          |
| 4.2.4 Vibrational exposure .....                                                                   | 18          |
| 4.3 Physical characteristics .....                                                                 | 18          |
| 4.3.1 Strength .....                                                                               | 18          |
| 4.3.2 Fire resistance.....                                                                         | 18          |
| 4.3.3 Surface protection .....                                                                     | 18          |
| 4.3.4 Noise .....                                                                                  | 18          |
| 4.3.5 Whole life environmental impact.....                                                         | 19          |
| 4.3.6 Leakage.....                                                                                 | 19          |
| 4.3.7 Length and stroke.....                                                                       | 19          |
| 4.3.8 Overall dimensions and interface .....                                                       | 19          |
| 4.3.9 Mass .....                                                                                   | 19          |
| 4.4 Functional requirements .....                                                                  | 20          |
| 4.4.1 Orientation .....                                                                            | 20          |
| 4.4.2 Nominal force ( $F_{c,vn}$ , $F_{e,vn}$ ) and nominal velocity ( $v_n$ ) .....               | 20          |
| 4.4.3 Maximum force ( $F_{cmax,vmax}$ , $F_{emax,vmax}$ ) and maximum velocity ( $v_{max}$ ) ..... | 20          |
| 4.4.4 Force as a function of displacement characteristic.....                                      | 20          |
| 4.4.5 Force as a function of velocity characteristic .....                                         | 24          |
| 4.4.6 Dynamic characteristics .....                                                                | 27          |
| 4.4.7 Priming.....                                                                                 | 29          |
| <b>5 Test methods.....</b>                                                                         | <b>29</b>   |
| 5.1 General requirements.....                                                                      | 29          |
| 5.1.1 Test compliance.....                                                                         | 29          |
| 5.1.2 Testing machine.....                                                                         | 29          |
| 5.1.3 Test temperature .....                                                                       | 30          |
| 5.1.4 Test sample .....                                                                            | 30          |
| 5.2 Operational environment requirements .....                                                     | 30          |
| 5.2.1 Service conditions .....                                                                     | 30          |
| 5.2.2 Climatic conditions.....                                                                     | 31          |
| 5.2.3 Special environmental conditions .....                                                       | 34          |
| 5.2.4 Vibrational exposure .....                                                                   | 34          |
| 5.3 Physical characteristics .....                                                                 | 35          |
| 5.3.1 Strength .....                                                                               | 35          |
| 5.3.2 Fire resistance.....                                                                         | 35          |

|              |                                                                                              |    |
|--------------|----------------------------------------------------------------------------------------------|----|
| 5.3.3        | Surface protection .....                                                                     | 35 |
| 5.3.4        | Noise .....                                                                                  | 35 |
| 5.3.5        | Whole life environmental impact .....                                                        | 35 |
| 5.3.6        | Leakage .....                                                                                | 36 |
| 5.3.7        | Length and stroke .....                                                                      | 36 |
| 5.3.8        | Overall dimensions and interface .....                                                       | 36 |
| 5.3.9        | Mass .....                                                                                   | 36 |
| 5.4          | Functional requirements .....                                                                | 36 |
| 5.4.1        | Orientation .....                                                                            | 36 |
| 5.4.2        | Nominal force ( $F_{c,vn}$ , $F_{e,vn}$ ) and nominal velocity ( $v_n$ ) .....               | 37 |
| 5.4.3        | Maximum force ( $F_{cmax,vmax}$ , $F_{emax,vmax}$ ) and maximum velocity ( $v_{max}$ ) ..... | 37 |
| 5.4.4        | Force as a function of displacement characteristic .....                                     | 37 |
| 5.4.5        | Force as a function of velocity characteristic .....                                         | 39 |
| 5.4.6        | Dynamic characteristics .....                                                                | 39 |
| 5.4.7        | Priming .....                                                                                | 39 |
| 6            | Production control .....                                                                     | 40 |
| 6.1          | General .....                                                                                | 40 |
| 6.2          | Product verification .....                                                                   | 40 |
| 6.3          | Results of the tests .....                                                                   | 40 |
| 7            | Marking .....                                                                                | 40 |
| 8            | Packaging .....                                                                              | 41 |
| 9            | Maintainability .....                                                                        | 41 |
| Annex A      | (informative) Damper specification .....                                                     | 42 |
| Annex B      | (informative) Damper dimensions .....                                                        | 46 |
| B.1          | Range of damper overall dimensions .....                                                     | 46 |
| B.2          | Calculating the damper length .....                                                          | 47 |
| B.3          | Preferred end mounting dimensions .....                                                      | 50 |
| Annex C      | (informative) Nominal velocities .....                                                       | 53 |
| Annex D      | (informative) Examples of force as a function of velocity characteristic .....               | 54 |
| Annex E      | (informative) Checks and tests to be performed according to damper category .....            | 56 |
| Annex F      | (informative) Dynamic test velocities .....                                                  | 57 |
| Annex G      | (informative) Conformity assessment procedures, samples, validity and monitoring .....       | 58 |
| G.1          | Conformity assessment procedure of the product .....                                         | 58 |
| G.2          | Validity of the product approval .....                                                       | 59 |
| G.3          | Control and monitoring of production quality .....                                           | 59 |
| G.4          | Traceability .....                                                                           | 59 |
| Bibliography | .....                                                                                        | 60 |

## SS-EN 13802:2013 (E)

### Foreword

This document (EN 13802:2013) has been prepared by Technical Committee CEN/TC 256 "Railway applications", 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 June 2014, and conflicting national standards shall be withdrawn at the latest by June 2014.

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

This document supersedes EN 13802:2004.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

The main changes with respect to the previous edition are listed below.

- Clause 1 The complete hydraulic dampers, with their end mountings, are now considered in the scope. This new consideration has been taken into account in the whole standard.
- Clause 2 The normative references have been updated.
- 4.2.1.2 A new item concerning the life cycle of the dampers has been added.
- 4.2.2.2 The value of  $T_{ao,min}$  to take by default has been decreased.
- 4.2.2.3 The value of  $T_{ae,min}$  to take by default has been decreased.
- 4.2.4 and 5.2.4 The requirements concerning the behaviour against the vibrational exposures are now given as recommendations.
- 4.3.3 A criterion about of the surface protection has been defined.
- 4.3.4 A criterion about the noise generated by the damper has been defined.
- 4.3.9 The supply of the value of the mass is now required.
- 4.4.1 A criterion about the orientation of the damper has been defined.
- 4.4.6 and 5.4.6 The definition of the dynamic characteristics of the dampers has been revised.
- 6.3 Requirements about the serial tests have been added.
- Clause 7 The position of the permanent marking of horizontally orientated dampers has been specified.
- B.2 Methods of calculation of the damper length have been defined in this new sub-clause.



- B.3 Preferred interface dimensions of end mountings have been defined in this new sub-clause.
- Annex F Dynamic test velocities have been defined in this new annex.

NOTE The above list of changes includes the significant technical changes from EN 13802:2004 but is not an exhaustive list of all modifications from the previous version.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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.

## SS-EN 13802:2013 (E)

### 1 Scope

This European Standard applies to hydraulic dampers and their end mountings used on rail vehicles. The dampers covered in this standard include:

- dampers that control the dynamic behaviour of a vehicle:
  - suspensions dampers, (e.g. primary vertical dampers, secondary vertical dampers and secondary lateral dampers);
  - yaw dampers;
  - roll dampers;
  - inter-vehicles dampers.
- dampers that control the dynamic behaviour of mechanical systems:
  - pantograph dampers;
  - motor dampers, etc.

All relevant terminology which is specific to the subject is defined in this European Standard.

### 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.

EN 13913, *Railway applications — Rubber suspension components — Elastomer-based mechanical parts*

EN 14363, *Railway applications — Testing for the acceptance of running characteristics of railway vehicles — Testing of running behaviour and stationary tests*

EN ISO 2813, *Paints and varnishes — Determination of specular gloss of non-metallic paint films at 20°, 60° and 85° (ISO 2813)*

EN ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227)*

### 3 Terms, definitions and symbols

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

NOTE 1 In this document, the spatial characteristics of the damper are defined with reference to its axes (see Figure 1). Axial characteristics are defined along the X-axis. Extension of the damper is defined as positive and compression as negative. Transverse characteristics are defined in the Y-Z plane. Rotations are defined as positive in a clockwise direction.

NOTE 2 Decimal multiple and sub-multiple of units defined below can be used.

### 3.1 Terms and definitions

#### 3.1.1

##### **damper**

hydraulic damper with end mountings

#### 3.1.2

##### **hydraulic damper**

device with a fluid as the damping medium

#### 3.1.3

##### **damper characteristic**

relationship (assuming that there is no force as a function of velocity phase shift) between damper force and damper velocity established at a damper displacement of large amplitude and low frequency to discount the dynamic influence of the damper structure and fluid stiffness

#### 3.1.4

##### **damper displacement**

displacement or stroke, relative axial displacement of the damper ends

#### 3.1.5

##### **damper fluid**

damping medium (usually oil)

#### 3.1.6

##### **damper specification**

document used to define the performance requirements and capabilities of a damper (see Annex A)

#### 3.1.7

##### **dynamic damper characteristic**

damper characteristic (see 3.1.3), but including the phase shift effect, and thus including influence of damper structure and fluid stiffness

#### 3.1.8

##### **end mounting**

components fitted at both ends of the damper for its mounting on the vehicle, usually elastomer based component

Note 1 to entry: Mountings are not specified in detail in this document.

#### 3.1.9

##### **friction characteristic type damper**

hydraulic damper that has a diagram force as a function of displacement which has a more or less rectangular shape (see Figure 7)

#### 3.1.10

##### **leakage**

visible evidence of accumulation of fluid, which has originated from within the damper

#### 3.1.11

##### **priming**

operation allowing the removal of temporary imperfection to the damper characteristic caused by entrapment of gas (usually air) in the damper pressure chamber

#### 3.1.12

##### **life time**

total time or distance travelled in which a damper remains in service use until its final withdrawal

Note 1 to entry: The life time can consist of several service intervals.