



**SLOVENSKI STANDARD**  
**kSIST FprEN 16451:2015**

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**Železniške naprave - Zavore - Nosilec zavorne obloge**

Railway applications - Braking - Brake pad holder

Bahnanwendungen - Bremse - Bremsbelaghalter

Applications ferroviaires - Freinage - Porte-garnitures de frein

**Ta slovenski standard je istoveten z: FprEN 16451**

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## Railway applications - Braking - Brake pad holder

Applications ferroviaires - Freinage - Porte-garnitures

Bahnanwendungen - Bremse - Bremsbelaghalter

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**FprEN 16451:2015 (E)**

**Foreword**

This document (FprEN 16451:2015) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This document is currently submitted to the Formal Vote.

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

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## Introduction

This European Standard gives the requirements to be met for the design, dimensioning, testing and quality assessment of brake pad holders. These requirements cannot be written in sufficient detail to ensure good workmanship or proper construction. Each manufacturer is therefore responsible for taking every necessary step to make sure, that the quality of workmanship and construction is such as to ensure accordance with good engineering practice.

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**FprEN 16451:2015 (E)****1 Scope**

The requirements contained in this European Standard apply to the brake pad holders with which the rail vehicles of main-line railways, regional and suburban railways are fitted. Brake pad holders pursuant to this standard are to be made from ferrous materials e.g. cast iron, cast steel or forged steel. Brake pad holders made of non-ferrous materials are not subject of this 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 10204, *Metallic products — Types of inspection documents*

EN 10328, *Iron and steel — Determination of the conventional depth of hardening after surface heating*

EN 14478, *Railway applications — Braking — Generic vocabulary*

EN 22768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications (ISO 2768-1)*

EN 50125-1, *Railway applications — Environmental conditions for equipment — Part 1: Rolling stock and on-board equipment*

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

EN 60068-2-47, *Environmental testing — Part 2-47: Tests — Mounting of specimens for vibration, impact and similar dynamic tests (IEC 60068-2-47)*

EN 60721-3-5:1997, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 5: Ground vehicle installations (IEC 60721-3-5)*

EN 61373, *Railway applications — Rolling stock equipment — Shock and vibration tests (IEC 61373)*

EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method (ISO 6506-1)*

EN ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method (ISO 6507-1)*

EN ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T) (ISO 6508-1)*

EN ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1)*

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

EN ISO 14284, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition (ISO 14284)*

ISO 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*



### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14478 and the following apply.

#### 3.1

##### **compact disc brake unit**

disc brake unit, generally with reduced envelope and weight with a single interface to the bogie

#### 3.2

##### **operational mounting condition**

normal and nominal conditions of assembly on a vehicle

#### 3.3

##### **referenced technical drawings**

drawings used for definition of brake pad holder

### 4 Symbols and abbreviations

A%	Percentage elongation after fracture (as specified by ISO 6892-1)
$F$	Force
g	Gravity acceleration 9,81 m/s <sup>2</sup>
KV	Absorbed energy for a V-notch test piece (as specified by ISO 148-1)
KU	Absorbed energy for a U-notch test piece (as specified by ISO 148-1)
SL1 and SL2	Classes of loading
T1 and TX	Classes of temperature as specified by EN 50125-1
VL and VH	Classes of vibration

### 5 Design and manufacture

#### 5.1 Latch mechanism

The design of the latch mechanism to retain the brake pads shall satisfy the following principle:

- there shall be a positive retention of the latch when in the closed position;
- no single point failure of the latch mechanism and its attachment to the pad holder shall result in a loss of brake pads;
- ease of operation – no special tools to open and close the latch mechanism. Preferably designed to allow use of simple flat bladed screw driver;
- during pad renewal the latch mechanism should remain attached to the brake pad holder;
- renewal of a defective latch mechanism should not require the dismantling of the brake pad holder from the brake unit.

#### 5.2 Interchangeability by applying same main dimensions and geometry

##### 5.2.1 General

Brake pad holders can be designed based on different concepts. The requirements specially for interchangeability are defined below.

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### 5.2.2 Interchangeability for “conventional” brake unit

The requirements for the dimensions for geometric interchangeability for “conventional” brake unit are given in Annex A. These dimensions are compatible with brake pads defined in Annex D. If required a device with mechanical coding should be used. Annex C indicates an example for application.

### 5.2.3 Interchangeability for “compact” brake unit

The requirements for the dimensions for geometric interchangeability for “compact” brake unit are given in Annex B. These dimensions are compatible with brake pads defined in Annex D. If required a device with mechanical coding should be used. Annex C indicates an example for application.

### 5.2.4 Dimensional conformity

The dimensional requirements are defined in referenced technical drawings. The conformity assessment of the dimensions of the brake pad holder is verified in accordance with 6.3.1.

## 5.3 Material

As specified in the scope, this standard applies only to the brake pad holders in “ferrous material” e.g. cast iron or steel, manufactured by a forging or casting process. The material used for the design of the brake pad holder shall conform to the technical requirements defined in this document.

The conformity assessment of the brake pad holder material, with referenced technical drawings, shall be verified in accordance with 6.3.2.

## 5.4 Environmental conditions

### 5.4.1 Ambient temperature

The brake pad holder shall be able to operate within the temperature classes T1 and TX as specified by EN 50125-1, where the upper limit for TX is +70 °C external air temperature.

### 5.4.2 Other environmental conditions

#### 5.4.2.1 General

The following environmental conditions shall be considered in the design of the brake pad holder.

If not specifically required to be tested as part of the type testing requirements in this standard, suitable tests and/or design assessments considering the effect of the following environmental conditions on the brake pad holder shall be used in the development/design proving of the device, prior to type testing.

#### 5.4.2.2 Humidity

The following external humidity levels shall be considered:

- yearly average:  $\leq 75$  % relative humidity;
- on 30 days in the year continuously: between 75 % and 95 % relative humidity;
- on the other days occasionally: between 95 % and 100 % relative humidity;
- maximum absolute humidity: 30 g/m<sup>3</sup> occurring in tunnels.