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Railway applications – Braking systems of high speed trains – Part 2: Test methods



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EUROPEAN STANDARD

EN 15734-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2010

ICS 45.060.01

English Version

Railway applications - Braking systems of high speed trains - Part 2: Test methods

Applications ferroviaires - Systèmes de freinage pour trains
à grande vitesse - Partie 2 : Méthodes d'essai

Bahnanwendungen - Bremsysteme für
Hochgeschwindigkeitszüge - Teil 2: Prüfverfahren

This European Standard was approved by CEN on 23 October 2010.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 15734-2:2010) 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of an identical text or by endorsement, at the latest by May 2011, and conflicting national standards shall be withdrawn at the latest by May 2011.

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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2008/57/EC.

For relationship with the EU Directive, see informative Annex ZA, which is an integral part of this document.

EN 15734, *Railway applications — Brake systems of high speed trains*, consists of the following parts:

- *Part 1: Requirements and definitions*
- *Part 2: Test methods*

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies test methods and acceptance criteria for a brake system for use in high speed trains as described in the TSI Rolling Stock, operating on routes of the trans-European high-speed rail system.

The tests defined in this document have the purpose of verifying that the braking performance and functions of the train's brake system comply at least with the respective requirements of EN 15734-1.

This European Standard is applicable to:

- new vehicles of high speed trains;
- new constructions of existing vehicle types;
- major overhauls of the above-mentioned vehicles if they involve redesigning or extensive alteration to the brake system of the vehicle concerned.

The functional testing requirements set out in this document assume the vehicles are fitted with a brake system architecture that follows the UIC air brake pipe control principles.

High Speed Rolling Stock can be fitted with alternative brake system architectures that do not employ brake pipe control. In these cases equivalent testing requirements will need to be generated to test the functional performance of brake system fitted.

2 Normative references

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

EN 15220-1, *Railway applications — Brake indicators — Part 1: Pneumatic operation brake indicators*

EN 15327-1, *Railway applications — Passenger alarm subsystem — Part 1: General requirements and passenger interface for the passenger emergency brake system*

EN 15355, *Railway applications — Braking — Distributor valves and distributor-isolating devices*

EN 15595, *Railway applications — Braking — Wheel slide protection*

EN 15611, *Railway applications — Braking — Relay valves*

EN 15663, *Railway applications — Definition of vehicle reference masses*

EN 15734-1:2010, *Railway applications — Braking systems of high speed trains — Part 1: Requirements and definitions*

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

EN 50128, *Railway applications — Communications, signalling and processing systems — Software for railway control and protection systems*

UIC 544-1:2004, *Brakes — Braking power*

3 Terms and definitions

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

- 3.1 approval body**
Notified Body or National Railway Authority that conforms to EN ISO/IEC 17025
- 3.2 test(ing) institute**
test(ing) institute that conforms to EN ISO/IEC 17025
- 3.3 check**
test performed as a discrete measurement or visual inspection
- 3.4 record**
results recorded either graphically or electronically
- 3.5 type test**
test of one or more devices, system or complete vehicle demonstrating that the design meets the required specifications and the relevant standards
- NOTE (Type) tests are performed by a test institute.
- 3.6 routine test**
vehicle test that is performed during or after manufacture to confirm conformity to specified criteria

4 Symbols, units and abbreviations

For the purpose of this document, the following symbols, units and abbreviations apply:

| | |
|------|-------------------------------|
| ATC | Automatic Train Control |
| ATP | Automatic Train Protection |
| BC | Brake Control |
| BP | Brake Pipe |
| DP | Data Processing |
| EP | Electro Pneumatic Brake |
| ETCS | European Train Control System |
| R+Mg | Brake mode R+Mg |
| MRP | Main Reservoir Pipe |
| MTB | Magnetic Track Brake |
| R | Brake mode R |

Sifa Driver's vigilance control (German: "Sicherheitsfahrerschaltung")

WRMS Wheel Rotation Monitoring System

WSP Wheel Slide Protection System

1 bar = 1 000 mbar = 10^5 N/m² = 10^5 Pa = 10^{-1} MPa

5 Requirements

5.1 General

This document defines the content of the static and dynamic tests dedicated to the brakes, which are needed for the following phases:

- type tests which demonstrate that the brake system conforms to the requirements. They are done with a pre-serial unit or with the first unit of a serial production;
- routine tests which confirm the technical stability of the production process of the system and its subsystems. For this purpose the basic features and functions of the system and its subsystems are to be checked;
- verification that the braking performance and the functions of the train's braking system comply at least with the respective requirements of EN 15734-1;
- identification of data for the verification of the brake performance and the functions of the train's braking system.

The document also identifies relevant data to be recorded.

The type and routine tests are as follows:

- tests with a single vehicle (Level 1);
- tests with one single unit (Level 2). These tests serve to check the common functions of the unit and the interfaces between the vehicles;
- tests with multiple units consisting of two to n units (Level 3) up to the maximum configuration. These tests serve to check the common functions of the train composition and the interfaces between the units.