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Railway applications - Braking - Wheel slide protection

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 15595:2009+A1:2011 sisaldab Euroopa standardi EN 15595:2009+A1:2011 ingliskeelset teksti.

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English Version

Railway applications - Braking - Wheel slide protection

Applications ferroviaires - Freinage - Anti-enrayeur

Bahnanwendungen - Bremse - Gleitschutz

This European Standard was approved by CEN on 3 January 2009 and includes Amendment 1 approved by CEN on 3 April 2011.

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Foreword

This document (EN 15595:2009+A1:2011) 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of an identical text or by endorsement, at the latest by November 2011, and conflicting national standards shall be withdrawn at the latest by November 2011.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 includes Amendment 1, approved by CEN on 2011-04-03.

This document supersedes EN 15595:2009.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**.

A1 This document has been prepared under a mandate given to CEN/CENELEC/ETSI by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2008/57/EC.

For relationship with EU Directive 2008/57/EC, see informative Annex ZA, which is an integral part of this document. **A1**

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 United Kingdom.

Introduction

The objectives of fitting WSP systems to trains are to assist in achieving the following:

- 1) minimum extension in stopping distance compared to stopping on clean dry rails (i.e. good adhesion conditions);
- 2) minimum level of wheelset damage due to wheel slide or wheel 'lock-up';
- 3) minimum level of track damage;
- 4) for pneumatic brake systems, minimum increase in air consumption compared to a "non WSP" stop.

The particular priority of these above objectives may vary for different classes of applications or even for a particular application.

Trains fitted with WSP systems may consist of single vehicles, locomotive and trailing vehicles or may be high speed trains, multiple units, commuter trains, wagons, etc.

Such trains will be equipped with a friction brake and may also be equipped with dynamic brakes, magnetic track brakes and/or eddy current brakes and may also be fitted with adhesion improving systems e.g. sanding.

This standard covers both the system acceptance requirements as well as the application specific requirements for WSP Systems.

Each manufacturer is 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.

1 Scope

This European Standard specifies the minimum criteria for system acceptance/type approval of a new wheel slide protection system and implementation of accepted WSP to specific vehicle applications and route requirements, as well as requirements for wheel rotation monitoring (WRM).. This includes the design, testing and quality assessment of the WSP system and its components.

This European Standard is applicable to wheel slide protection systems for pneumatic braking systems without taking the type of vehicles and track-gauge into consideration. The general principles of this standard can also apply as a reference for other types of braking systems and other kinds of railway vehicles. The system is designed to control the sliding of wheels of railway vehicles during braking under degraded adhesion conditions to prevent wheel damage and to minimize the extension of the stopping distance under degraded adhesion conditions by optimizing the available adhesion between wheel and rail.

This European Standard does not apply to the following categories of vehicles:

- 1) tramways;
- 2) light railways;
- 3) metros on steel wheels;
- 4) metros on rubber tyred wheels.

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 14478:2005, *Railway Applications — Braking — Generic Vocabulary*

EN 50121-3-1, *Railway applications — Electromagnetic compatibility — Part 3-1: Rolling stock — Train and complete vehicle*

EN 50121-3-2, *Railway applications — Electromagnetic compatibility — Part 3-2: Rolling stock — Apparatus*

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

EN 50126-1, *Railway applications — The specification and demonstration of reliability, availability, maintainability and safety (RAMS) — Part 1: Basic requirements and generic process*

EN 50128, *Railway applications — Communications, Signalling and Processing Systems — Software for Railway Control and Protection Systems*

EN 50155:2007, *Railway applications — Electronic equipment used on rolling stock*

EN 60529:1991, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN 61373, *Railway applications — Rolling stock equipment — Shock and vibration tests (IEC 61373:1999)*

EN ISO 228-2, *Pipe threads where pressure-tight joints are not made on the threads — Part 2: Verification by means of limit gauges (ISO 228-2:1987)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005)*

ISO 8573-1, *Compressed air — Part 1: Contaminants and purity classes*

3 Terms and definitions, symbols, and abbreviations

3.1 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 14478:2005 and the following more specific definitions apply.

3.1.1 Wheel slide protection (WSP) terms

3.1.1.1

adhesion profile

predefined set of data representing the adhesion characteristics of a section of running line

3.1.1.2

relative air consumption

ratio of the total volume of air consumed during a braking stop with WSP activity against that which would be consumed during a stop with no WSP activity

3.1.1.3

auxiliary reservoir

protected and dedicated source of pressure energy for local brake actuation and also known as a Brake Supply Reservoir

3.1.1.4

supplementary reservoir

pressure reservoir used for determination of relative air consumption

3.1.1.5

crush laden

vehicle load condition in excess of the normal fully laden condition that may arise during exceptional operating circumstances

3.1.1.6

low adhesion

conditions where the wheel/rail adhesion is insufficient to sustain the required braking rate

3.1.1.7

true train speed

v_t

actual current train speed, also commonly referred to as "ground speed"

3.1.1.8

wheel lock

extreme example of wheel slide where the wheel set ceases to rotate during braking, whilst the vehicle is in motion

3.1.1.9

wheel slide

condition where a wheel set rotational speed is lower than that corresponding to the true train speed

3.1.1.10

circumferential speed

rotational speed of wheel set times radius of wheel