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Tehnične zahteve za pogon, obratovanje in delovanje mestne železnice**

Railway applications - Track - Road-rail machines and associated equipment - Part 4:
Technical requirements for running, travelling and working on urban rail

Bahnanwendungen - Oberbau - Zwei-Wege-Maschinen und zugehörige Ausstattung -
Teil 4: Technische Anforderungen an Fahrbetrieb, Versetzfahrten und Arbeitseinsatz in
Schienennahverkehrssystemen

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Railway applications - Track - Road-rail machines and associated equipment - Part 4: Technical requirements for running, travelling and working on urban rail

Bahnanwendungen - Oberbau - Straßen-Maschinen und zugehörige Ausstattung - Teil 4: Technische Anforderungen an Fahrbetrieb, Versetzfahrten und Arbeitseinsatz in Schienennahverkehrssystemen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 256.

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prEN 15746-4:2015 (E)

European foreword

This document (prEN 15746-4:2015) 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 CEN Enquiry.

EN 15746, *Railway applications — Track — Road-rail machines and associated equipment*, is currently composed with the following parts:

- *Part 1: Technical requirements for running and working;*
- *Part 2: General safety requirements;*
- *Part 3: Technical requirements for running [currently at Enquiry stage];*
- *Part 4: Technical requirements for running, travelling and working on urban rail [currently at Enquiry stage].*

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Introduction

This European Standard was prepared to meet the essential requirements of EU Directives to facilitate an open market for goods and services.

This document is the fourth of a series of four parts of the European Standard: Railway applications — Track — Road-rail machines and associated equipment, dealing with railway specific risks of the road-rail machines when running, travelling and working on railway infrastructures:

- Part 1 covers the technical requirements for the machines in working and travelling modes, and is applicable for all machines.
- Part 2 covers the safety requirements for the machines in working and travelling modes; this is a harmonized standard with the European Machinery Directive 2008/57/EC.
- Part 3 covers the essential requirements for the machines that have a running mode and run on tracks within the scope of the Railway Directive 2007/58/EC; this is a harmonized standard with the Railway Interoperability Directive 2008/57/EC and its associated Technical Specifications for Interoperability (TSI).
- Part 4 covers the technical requirements for the machines intended to have working, travelling and/or running mode on urban rail.

Part 1 defines requirements for approval of the machine for use on the railway, depending on the decision of the Infrastructure Manager or National rules the assessment of conformance could be by the Infrastructure Manager concerned, by a third party assessor or declaration of conformity by the manufacturer.

Part 2 defines requirements for the machine to be declared conformant by the manufacturer, except in the case of machines classified under Annex 4 of the Machinery Directive, which require a conformity check in conjunction with a notified body.

Part 3 defines requirements for running on the European railway network, assessment of conformity is by a notified body as prescribed in the Railway Interoperability Directive.

Part 4 defines requirements for approval of the machine for use on urban rail, depending on the decision of the controller of the network or National rules the assessment of conformance could be by the urban rail controller concerned, by a third party assessor or declaration of conformity by the manufacturer.

Additional requirements or deviations to parts 1, 2 and 3 for urban rail are detailed in part 4.

The risks which exist in all mechanical, electrical, hydraulic, pneumatic and other components of machines and which are dealt with in the relevant European Standards are not within the scope of this European Standard. Where necessary, references are made to appropriate standards of this type.

1 Scope

1.1 General

This European Standard deals with the technical requirements to minimize the specific railway hazards of self-propelled road-rail machines – henceforward referred to as machines – and associated equipment, which can arise during the commissioning, the operation and the maintenance of machines when carried out in accordance with the specification given by the manufacturer or his authorized representative when designed and intended for running, travelling and/or working on urban railways only. Where a machine is designed and intended for use on mainline and urban rail the most onerous conditions of prEN 15746-1 and prEN 15746-4 will need to be complied with.

The requirements in this standard amend those in prEN 15746-1 as required for the use of the machine on urban railways.

This European Standard does not apply to the following:

- the requirements for quality of the work or performance of the machine;
- the specific requirements established by the machine operator for the use of machines, which will be the subject of negotiation between the manufacturer and the controller of an urban railway;
- moving and working while not on rails;
- separate machines temporarily mounted on machines and associated equipment.

This European Standard does not establish the additional requirements for the following:

- operation subject to special rules, e.g. potentially explosive atmospheres;
- hazards due to natural causes, e.g. earthquake, lightning, flooding;
- working methods;
- operation in severe working conditions requiring special measures, e.g. work in tunnels or in cuttings, extreme environmental conditions such as: freezing temperatures, high temperatures, corrosive environments, tropical environments, contaminating environments, strong magnetic fields;
- hazards occurring when used to handle suspended loads which may swing freely.

For a road-rail machine it is assumed that an EU road permissible host vehicle will offer an accepted safety level for its designed basic functions before conversion. Unless explicitly stated otherwise in a particular clause this specific aspect is not dealt with in this European Standard.

Other track construction and maintenance machines used on railway tracks are dealt with in other European Standards, see Annex B.

1.2 Scope of urban rail

Urban rail systems cover both Urban Guided Transport systems (UGT) and other rail systems which might be excluded from the scope of the Interoperability Directive 2008/57/EC (Article 1.3 (a) and (b)).

Urban Guided Transport systems (UGT), which cover metro, tram and light rail, are defined as public transport systems permanently guided at least by one rail, intended for the operation of local, urban and suburban passenger services with self-propelled vehicles and operated either segregated or not from general road and pedestrian traffic.

Categories of urban rail systems include:

- (I) Metros: UGT systems operated on their own right of way and segregated from general road and pedestrian traffic. They are consequently designed for operations in tunnel, viaducts or on surface level but with physical separation in such a way that inadvertent access is not possible. In different parts of the world, Metro systems are also known as the underground, the subway or the tube. Rail systems with specific construction issues operating on a segregated guideway (e.g. monorail, rack railways) are also treated as Metros as long as they are designated as part of the urban public transport network.
- (II) Trams: UGT systems not segregated from general road and pedestrian traffic, which share their right of way with general road and/or pedestrian traffic and are therefore embedded in their relevant national road traffic legislation (highway codes and specific adaptations).
- (III) Light Rail: Light Rail is defined as a UGT system operated in parts of the system not segregated from general road and pedestrian traffic, and in parts of the system with segregated right-of-way. The segregation may include some sections of line where inadvertent access is not possible.
- (IV) Local rail systems which by national decision complying with Article 1 (3) a) or b) of Directive 2008/57/EC may be excluded from the European Community Rail System.

NOTE Such systems connect city centres with their suburban hinterland or regional local centres. Such systems are operated on rights of way which are basically segregated from general road and/or pedestrian traffic and/or which can be declared by law as independent from the public environment even if they are not segregated by location, form of construction or appropriate measures. For historical reasons they might be strongly influenced by conventional railway parameters and their operations procedures.

1.3 Category of machines for this European Standard

This European Standard applies to Category 9 machines as described in prEN 15746-1:2015, Clause 4.

1.4 Validity of this European Standard

This European Standard applies to all machines which are ordered one year after the publication date by CEN of 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 13452-1:2003, *Railway applications — Braking — Mass transit brake systems — Part 1: Performance requirements*

EN 13452-2:2003, *Railway applications — Braking — Mass transit brake systems — Part 2: Methods of test*

EN 14033-2:2008+A1:2011, *Railway applications — Track — Railbound construction and maintenance machines — Part 2: Technical requirements for working*

prEN 15746-1:2015 *Railway applications — Track — Road-rail machines and associated equipment — Part 1: Technical requirements for travelling and working*

prEN 15746-2:2015, *Railway applications — Track — Road-rail machines and associated equipment — Part 2: General safety requirements*

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prEN 15746-3:2015, *Railway applications — Track — Road-rail machines and associated equipment — Part 3: Technical requirements for running*

EN 60204-1:2006, *Safety of machinery - Electrical equipment of machines – Part 1: General requirements (IEC 60204-1:2005, modified)*

EN ISO 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 15746-1:2015, prEN 15746-2:2015, EN ISO 12100:2010 and, if not specified before EN 13452-1:2003 and EN 13452-2:2003, and the following apply.

3.1**urban rail system**

railway infrastructure as described in 1.2

Note 1 to entry: These systems can be trams, light rail, metro and local rail system.

4 Machines designed for working and travelling on urban rail**4.1 Compliance with prEN 15746-1**

Except as shown in 4.2, machines shall comply with prEN 15746-1.

4.2 Exceptions to compliance with prEN 15746-1**4.2.1 Definition of road rail machine, prEN 15746-1:2015, 3.1**

To replace prEN 15746-1:2015, Definition 3.1 with the following:

road-rail machine

self propelled machine that can move on rail (guided by the track) and on ground

Note 1 to entry: It is normally a road vehicle adapted for moving on rail also, but can be a specially designed rail vehicle for moving on the ground also.

Note 2 to entry: It does not imply that the machine is suitable for use on the public road.

Note 3 to entry: Vehicles which are not track guided themselves but have attached track guided equipment are not regarded as road-rail machines.

4.2.2 General, prEN 15746-1:2015, 5.1

To replace prEN 15746-1:2015, Subclause 5.1, machines do not have to comply with geometric limits requirements stated. The geometric parameter of the track of the urban rail for which the machine is intended to travel shall be requested from the infrastructure manager of the urban rail system. The manufacturer shall state in the instruction handbook the system the machine is intended to travel and work on.

4.2.3 Gauge, prEN 15746-1:2015, 5.2.1

To replace prEN 15746-1:2015, Subclause 5.2.1, machines do not have to comply with gauging requirements stated. The gauge of the urban rail for which the machine is intended to travel shall be

requested from the infrastructure manager of the urban rail system. The manufacturer shall state in the instruction handbook the system the machine is intended to travel on.

4.2.4 Road rail machines in travelling mode, prEN 15746-1:2015, 5.2.2

prEN 15746-1:2015, Subclause 5.2.2 is applicable except moveable parts and assemblies do not need to be stowed and secured. It is sufficient, that the transport position of working equipment that is able to foul the kinematic envelope shall be clearly recognizable or displayed to the driver/operator.

4.2.5 Working limit, prEN 15746-1:2015, 5.2.3

In prEN 15746-1:2015, 5.2.3 in where it refers to EN 14033-2:2008+A1:2011, 5.3, machines do not have to comply with this working limit, or the 1 300 mm revolving superstructure limitation. The limits for the urban rail for which the machine is intended to work shall be requested from the infrastructure manager of the urban rail system. The manufacturer shall state in the instruction handbook the system the machine is intended to work on.

4.2.6 Lateral limit exceedance, prEN 15746-1:2015, 5.2.4

Machines do not need to comply with prEN 15746-1:2015, 5.2.4.

4.2.7 Limits in lower area, prEN 15746-1:2015, 5.2.5

In prEN 15746-1:2015, 5.2.5.2, where it refers to EN 14033-2:2008+A1:2011, Annex D machines do not have to comply with this working limit. The limits for the urban rail for which the machine is intended to work shall be requested from the infrastructure manager of the urban rail system. The manufacturer shall state in the instruction handbook the system the machine is intended to work on.

4.2.8 Working limit, prEN 15746-1:2015, 5.2.6

In prEN 15746-1:2015, 5.2.6, where it refers to maximum work position heights shown in Annex A machines do not have to comply with this limit. The limit for the urban rail for which the machine is intended to work is derived from the overhead wire height, which shall be requested from the infrastructure manager of the urban rail system. The manufacturer shall state in the instruction handbook the system the machine is intended to work on.

On some urban rail systems it is permissible to work on live overhead equipment, see 4.3.

4.2.9 Requirements for clearance of track obstacles, prEN 15746-1:2015, 5.3

Machines do not need to comply with prEN 15746-1:2015, 5.3 if not requested from the infrastructure manager of the urban rail system. In such case the manufacturer shall state in the instruction handbook that the machine will not retain rail guidance while passing over obstacles.

4.2.10 Interaction with the infrastructure, prEN 15746-1:2015, 5.4

In prEN 15746-1:2015, 5.4 machines do not have to comply with the limits shown. The limits for the urban rail for which the machine is intended to work shall be requested from the infrastructure manager of the urban rail system. The machine shall be designed to comply with the limits stated by the infrastructure manager. The manufacturer shall state in the instruction handbook the system the machine is intended to work on.

4.2.11 Safety against derailment, prEN 15746-1:2015, 5.5

Machines shall comply with prEN 15746-1:2015, 5.5 except that machines do not have to comply with the geometric track limits shown. The geometric track limits for the urban rail for which the machine is intended to operate shall be requested from the infrastructure manager of the urban rail system. The manufacturer shall state in the instruction handbook the system the machine is intended to operate on.