# SLOVENSKI STANDARD
# SIST EN 15746-1:2011

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**Železniške naprave - Zgornji ustroj - Dvopotna železniška vozila in oprema - 1. del: Tehnične zahteve za vožnjo in delovanje**

Railway applications - Track - Road-rail machines and associated equipment - Part 1: Technical requirements for running and working

Bahnanwendungen - Obrbau - Zwei-Wege-Maschinen und zugehörige Ausstattung - Teil 1: Technische Anforderungen an das Fahren und den Arbeitseinsatz



Applications ferroviaires - Voie - Machines rail-route et équipements associés - Partie 1 : Prescriptions techniques pour la circulation et le travail



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# Railway applications - Track - Road-rail machines and associated equipment - Part 1: Technical requirements for running and working

Applications ferroviaires - Voie - Machines rail-route et équipements associés - Partie 1: Prescriptions techniques pour la circulation et le travail

Bahnanwendungen - Oberbau - Zwei-Wege Maschinen und zugehörige Ausstattung - Teil 1: Technische Anforderungen an das Fahren und den Arbeitseinsatz

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 15746-1:2010) 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of an identical text or by endorsement, at the latest by October 2010, and conflicting national standards shall be withdrawn at the latest by October 2010.

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# Introduction

EN 15746, *Railway applications — Track — Road-rail machines and associated equipment*, consists of the following parts:

— *Part 1: Technical requirements for running and working*

— *Part 2: General safety requirements*

This European Standard is a type C standard as stated in EN ISO 12100-1:2003 and EN ISO 12100-2:2003.

The machinery concerned and the extent to which hazards, hazardous situation and events are covered are indicated in the scope of this European Standard.

Road-rail machines as specified in 3.1 form the object of this European Standard.

This European Standard deals with railway specific risks of the road-rail machines, defined in Clause 4 when running and working on railway infrastructures.

The safety requirements in relation to the Machinery Directive are dealt with in EN 15746-2:2010 of this series of standards.



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. If 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 authorised representative.

Part 1 of EN 15746 defines requirements for approval of the machine by an authorised body; 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.

Additional requirements can apply for running on infrastructures with narrow gauge or broad gauge lines, lines of tramways, railways utilizing other than adhesion between the rail and rail wheels and underground infrastructures.

This European Standard is also applicable for machines and associated equipment that in working configuration are partly supported on the ballast or the formation.

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 infrastructure manager;

— running and working whilst not on rails;

— separate machines temporarily mounted on machines and associated equipment;

— demountable machines as defined in 3.2;

— trailers as defined in 3.3, including road-rail trailers.

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 due to errors in software;

— hazards occurring when used to handle suspended loads which may swing freely.

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

### 1.2 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 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 280, *Mobile elevating work platforms — Design calculations — Stability criteria — Construction — Safety — Examinations and tests*

EN 286-3, *Simple unfired pressure vessels designed to contain air or nitrogen — Part 3: Steel pressure vessels designed for air braking equipment and auxiliary pneumatic equipment for railway rolling stock*

EN 286-4, *Simple unfired pressure vessels designed to contain air or nitrogen — Part 4: Aluminium alloy pressure vessels designed for air braking equipment and auxiliary pneumatic equipment for railway rolling stock*

EN 791, *Drill rigs — Safety*

EN 12663:2000, *Railway applications — Structural requirements of railway vehicle bodies*



EN 13309, *Construction machinery — Electromagnetic compatibility of machines with internal electrical power supply*

EN 13715, *Railway applications — Wheelsets and bogies — Wheels — Wheels tread*



EN 14033-1:2008, *Railway applications — Track — Railbound construction and maintenance machines — Part 1: Technical requirements for running*

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

EN 14363:2005, *Railway applications — Testing for the acceptance of running characteristics of railway vehicles — Testing of running behaviour and stationary tests*

EN 14601, *Railway applications — Straight and angled end cocks for brake pipe and main reservoir pipe*

EN 15153-1, *Railway applications — External visible and audible warning devices for high speed trains — Part 1: Head, marker and tail lamps*

EN 15153-2, *Railway Applications — External visible and audible warning devices for high speed trains — Part 2: Warning horns*

EN 15273-2:2009, *Railway applications — Gauges — Part 2: Rolling stock gauge*

EN 15437 (all parts), *Railway applications — Axlebox condition monitoring — Interface and design requirements*

EN 15528, *Railway applications — Line categories for managing the interface between load limits of vehicles and infrastructure*

EN 15746-2:2010, *Railway applications — Track — Road-rail machines and associated equipment — Part 2: General safety requirements*

prEN 15954-1:2009, *Railway applications — Track — Trailers and associated equipment — Part 1: Technical requirements for running and working*

prEN 15954-2:2009, *Railway applications — Track — Trailers and associated equipment — Part 2: General safety requirements*

EN 50121-3-1:2006, *Railway applications — Electromagnetic compatibility — Part 3-1: Rolling stock — Train and complete vehicle*

EN 50121-3-2:2006, *Railway applications — Electromagnetic compatibility — Part 3-2: Rolling stock — Apparatus*

EN 50122-1, *Railway applications — Fixed installations — Part 1: Protective provisions relating to electrical safety and earthing*

EN 50238:2003, *Railway applications — Compatibility between rolling stock and train detection systems*

EN 60947 (all parts), *Low-voltage switchgear and controlgear*

EN ISO 7731, *Ergonomics — Danger signals for public and work areas — Auditory danger signals (ISO 7731:2003)*

EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

UIC 545, *Brakes — Inscriptions, marks and signs* [1)]



## 3 Terms and definitions



For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 and the following apply.

**3.1**
**road-rail machine**
self propelled machine that can run on rails and ground

NOTE 1 It is normally a road vehicle adapted for running on rail also, but can be a specially designed rail vehicle for running on the ground also.

NOTE 2 It does not imply that the machine is suitable for use on the public road.

**3.2**
**demountable machine**
machine that can run and work on rail and which is not intended to operate track signalling and control systems

NOTE 1 Such a machine is designed to get on and off track by its own means or with other lifting equipment. In the case of demounting by its own means these are not intended for running on the ground.

NOTE 2 Such a machine is permitted to work on the railway only under special operating conditions granted by the infrastructure manager and run under special conditions granted by the authorised body and/or the infrastructure manager.

**3.3**
**trailer**
non-self propelled machine that can be hauled on rail wheels

1) May be purchased from: Railway Technical Publications (ETF), 16 Rue Jean Rey, F-75015 Paris.

NOTE Trailers are not intended to operate track signalling and control systems and are not designed to be transported between work areas on their rail wheels.

**3.4**
**mobile elevating work platform**
**MEWP**
mobile machine intended to move persons to working positions where they carry out work from the work platform with the intention that persons get on and off the work platform at one defined access position, and which consists as a minimum of a work platform with controls, an extending structure and a chassis

**3.5**
**general attachment**
components or assembly of components which can be mounted onto the machine or equipment for a specific use

NOTE For equipment for specific use see ISO 6746-1, ISO 6746-2 and ISO 6016.

**3.6**
**railway specific attachment**
equipment capable of being temporarily fixed to and/or powered from the machine, but specifically excludes lifting accessories

**3.7**
**lifting accessory**
loose lifting tackle, i.e. components or equipment not attached to the machine and placed between the machinery and the load or on the load in order to attach it



**3.8**
**host vehicle**
basic road vehicle or machine which is converted to run additionally on rails



**3.9**
**manufacturer**
body that designs and constructs a road-rail machine, or converts the original machine/vehicle to a road-rail machine

**3.10**
**running configuration**
state of machine when it is on the rail and all movable parts are stowed and secured within the applicable kinematic gauge in accordance with EN 15273-2 and its acceptable exceedance

NOTE See 5.2.1.

**3.11**
**working configuration**
state of machine as soon as any part of the machine or its equipment is away from the running configuration

**3.12**
**on and off tracking configuration**
configuration of the machine when it is in a state that enables it to be on or off tracked

**3.13**
**running**
moving the machine in running configuration along the track

**3.14**
**operating track**
track corresponding to the criteria of the infrastructure manager on which vehicles may run under normal signalling arrangements (with or without a speed limit)

**3.15**
**working track**
track being maintained for which the geometrical parameters may reach the limiting values as specified in EN 14033-2:2008, Annex F and for which special operational restrictions may apply

**3.16**
**railway infrastructure**
all installations required for the running of railway vehicles

EXAMPLE Tracks, crossings, catenaries, signals.

**3.17**
**machine operator**
private or public undertaking which operates machines for the construction and maintenance of the infrastructure.

NOTE For the purposes of running on the railway the undertaking should have the status of a railway undertaking or should use the services of another railway undertaking or the infrastructure manager.

**3.18**
**operator**
person who handles the controls of a machine in order to perform the functions of the machine

**3.19**
**driver**
person who handles the controls of a machine in order to control the machine in running configuration moving along the track



NOTE The driver and operator can be the same.



**3.20**
**train**
self-propelled machine or assembly of vehicles/machines attached by couplings conforming to the relevant regulations of the authorised body and/or infrastructure manager

NOTE 1 This is only relevant to Category 8 machines.

NOTE 2 This does not exclude Category 9 machines from shunting conventional rail vehicles, where permitted by the infrastructure manager.

**3.21**
**special train**
assembly of vehicles/machines attached by couplings to a Category 9 machine, and conforming to the relevant requirements of the infrastructure manager

**3.22**
**rated load**
load that the lifting equipment has been designed for normal operation and the manufacturer states can be lifted in any specified position

**3.23**
**authorised body**
body in a state that, in accordance with the laws and prescriptions in force in that state, is competent to approve rail vehicles for the use in public rail traffic

**3.24**
**type testing**
examination of the first machine, of a new type, for build conformity to the requirements of this standard

**3.25**
**type conformance testing**
procedure to verify that the machine conforms to the design of the first machine of the type that has been approved

**3.26**
**type approval certificate**
document issued after the checking of documents and/or testing of vehicles in which the agreement of the running of the machine in the infrastructure is confirmed

**3.27**
**railway undertaking**
private or public undertaking whose main business is to provide rail transport services for goods and/ or passengers

NOTE Category 8 machines will require a railway undertaking to operate the machine on the open railway.

**3.28**
**infrastructure manager**
public body or undertaking responsible for establishing and maintaining railway infrastructure, as well as for operating the railway control and safety systems

**3.29**
**access permit**
document issued by the infrastructure manager for an approved machine to run on the railway infrastructure, if necessary with special access conditions



**3.30**
**working authorisation**
authorisation given by an infrastructure manager which permits a machine to work on that railway infrastructure



**3.31**
**visual test**
exam to establish whether all elements on the machine, system or component, e.g. protective devices, visual warning device, marking, are present and that documents and drawings correspond to the requirements

**3.32**
**measurement test**
test to establish whether the stated measurable parameters have met the requirements of this European Standard, e.g. geometric dimensions, safety distances, insulation resistance of electric circuits, noise, vibration

**3.33**
**functional test**
test to establish whether, in unloaded working conditions, the machine, including all safety devices, works as intended and all functions comply with the requirements and with the technical documentation

**3.34**
**load test**
test to establish whether the strength and stability of the equipment under load together with all safety devices and adjustments meets the requirements of this European Standard

**3.35**
**specific verification/measurement**
verification/measurement to establish whether the stated requirements of this European Standard have been met, e.g. calculations, technical documentation and specific documents of this European Standard

# 4 Machine categorisation

## 4.1 Categories

### 4.1.1 General

The machines are divided into four categories as shown in Table 1. As an example for these categories, see Figures 1 to 4.

**Table 1 — Machine categories**

| Incorporation into train | Configuration of road and rail wheels | Self-propelled running speed ($v$) | | References in standard |
|---|---|---|---|---|
| | | $v$ < 100 km/h | $v \leq$ 60 km/h | |
| Can be incorporated into a train with $v$ < 100 km/h | All | Category 8 | | See 4.1.2 |
| Cannot be incorporated into a train.<br><br>They are permitted to tow railway machines / vehicles if designed and approved by the authorised body. | Braking and traction directly on the rail wheels, load entirely on rail wheels. | Category 9 A | | See 4.1.3 |
| | Braking and traction indirect, from road wheels to rail wheels, load entirely on rail wheels. | | Category 9 B | See 4.1.4 |
| | Braking and traction on road wheels, load shared between road and rail wheels. | | Category 9 C | See 4.1.5 |
| Category 8 machines are designed to operate track signalling and control systems.<br>Category 9 machines in general are not required to operate track signalling and control systems and are only permitted to run and work on the railway under special restrictions defined by the infrastructure manager.<br>Category 9 machines designed to operate track signalling and control systems are permitted to be approved by the authorised body for being used on the national network. | | | | |



### 4.1.2 Example of Category 8 machine

Capable of incorporation into train. It is permitted to restrict the position of the machine in the train to the front or rear only if required.