



SLOVENSKI STANDARD

SIST EN 15687:2011

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Železniške naprave - Preskušanje vozniških karakteristik pri prevzemu tovornih vagonov s statično obtežbo na kolo med 225 kN in 250 kN

Railway applications - Testing for the acceptance of running characteristics of freight vehicles with static axle loads higher than 225 kN and up to 250 kN

Bahnanwendungen- Fahrtechnische Prüfung für die fahrtechnische Zulassung von Güterfahrzeugen mit statischer Radsatzlast von 225 kN bis 250 kN

Applications ferroviaires - Essais en vue de l'homologation du comportement dynamique des wagons de charge statique à l'essieu supérieure à 225 kN et jusqu'à 250 kN

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EUROPEAN STANDARD

EN 15687

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English Version

Railway applications - Testing for the acceptance of running characteristics of freight vehicles with static axle loads higher than 225 kN and up to 250 kN

Applications ferroviaires - Essais en vue de l'homologation du comportement dynamique des wagons pour charges statiques d'essieu de plus de 225 kN et jusqu'à 250kN

Bahnanwendungen- Fahrtechnische Prüfung für die fahrtechnische Zulassung von Güterfahrzeugen mit statischer Radsatzlast von 225 kN bis 250 kN

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 15687:2010) 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of an identical text or by endorsement, at the latest by November 2010, and conflicting national standards shall be withdrawn at the latest by November 2010.

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/CENELEC/ETSI by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2008/57.

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

It is intended that the requirements of this European Standard will be incorporated into EN 14363 when it is revised.

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.

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Introduction

This European Standard covers the on-track testing for acceptance of the running characteristics of railway freight vehicles with static axle loads higher than 225 kN and up to 250 kN. It was established by Working Group 10 Vehicle/Track Interaction of CEN Technical Committee 256 Railway Applications as a supplement to EN 14363:2005, which is related to the acceptance of railway vehicles with static axle loads up to 225 kN. It is planned to implement the requirements of this European Standard in a revision of EN 14363:2005.

The establishment of this European Standard was based on existing rules, practices and procedures. The following principles were applied:

- 1) the railway system requires comprehensive technical rules in order to ensure an acceptable interaction of vehicle and track;
- 2) due to the numerous national and international regulations new railway vehicles have to be tested and homologated before putting them into service. In addition, existing acceptance has to be checked when operating conditions are extended;
- 3) in view of the increasing significance of international traffic, the standardisation of existing regulations is required. In some cases, additional rules are required as well. An update of existing regulations is also needed due to the considerable progress achieved in the field of railway-specific methods for measuring, evaluation and data processing;
- 4) it is of particular importance that the existing level of safety and reliability is not compromised even when changes in design and operating practices are demanded, e.g. by the introduction of higher speeds, higher wheel forces.

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This European Standard takes account of the present state of the art which is generally applicable for test procedures and the evaluation of 'on-track' tests.

NOTE This European Standard is derived in essential parts from UIC 518-2 which has not yet been fully validated by experience.

The working group is aware that the combination of the test conditions is not always achievable. In some cases, the existing regulations may require exceptions for which justification will be provided to the acceptance body. In this event, the conditions which are not fulfilled will be identified.

The working group expects that existing shortcomings will be recognized in further investigations and during frequent application of the rules.

1 Scope

This European Standard specifies the testing for acceptance of the running characteristics of freight vehicles with static axle loads higher than 225 kN and up to 250 kN.

All requirements of EN 14363 are applicable with some adaptations concerning:

- the conditions of line tests;
- limit values for some assessment quantities.

Only differences for the special cases are listed.

The testing of the running characteristics applies principally to all freight vehicles, which operate without restriction on standard gauge tracks (1 435 mm).

NOTE 1 The testing of the running characteristics of:

- railways with different track layout,
- railways with non-standard gauge tracks

can be conducted by analogy with this European Standard.

The testing of running characteristics is part of the test for the acceptance of running characteristics of vehicles which:

- are newly developed,
- have had relevant design modifications, or
- have changes in their operating regimes.

The testing and acceptance of running characteristics refers to the complete vehicle including the running gear. If a running gear, which has already been tested and accepted, is used under a vehicle body of another design, this is considered a design modification. The procedure as described in EN 14363:2005, 5.2 is used.

NOTE 2 In addition to the testing of running characteristics for the acceptance of vehicles, the regulations can be generally applied in other technical tasks, e.g.:

- the checking for compliance against development contracts;
- the optimization of components, vehicles or running gear;
- the testing of influences, influencing parameters and relationships of dependence;
- the monitoring of track or vehicles in operational use.

The application of the full method and the stated limit values reflects unrestricted international operation.

Testing for acceptance of vehicles is based on some reference conditions of track. If these are not respected on certain lines, appropriate measures will be taken (speed modifications, additional tests etc.).

For national or multinational operations, variations may be authorized from the defined conditions. Permissible deviations are indicated in this European Standard.

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It is allowed to deviate from the rules laid down if evidence can be furnished that safety is at least the equivalent to that ensured by complying with these rules.

NOTE 3 For vehicles other than freight wagons with static axle loads higher than 225 kN and up to 250 kN it is possible to use the limit values stated in this European Standard together with the specified track conditions and operational conditions as a basis for proof of the same safety level.

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

EN 15528:2008, *Railway applications — Line categories for managing the interface between load limits of vehicles and infrastructure*

3 Terms and definitions

For the purposes of this European Standard, the symbols of quantities and characteristics given in Annex F of EN 14363:2005 and the following apply.

3.1 factor for track loading parameters (standards.iteh.ai)
lowest ratio between limit value and estimated value of maximum and quasi-static wheel force is expressed as follows:

$$\lambda' = \min(Q_{qst,lim}/Q_{qst}; Q_{lim}/Q_{max})$$

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4 Stationary tests

For stationary tests the requirements of EN 14363 shall apply.

5 On-track tests**5.1 General**

For the acceptance of a freight vehicle with static wheel force higher than 225 kN and up to 250 kN the following modifications of the procedure defined in EN 14363 shall be respected:

- for extension of acceptance the choice of the on-track test type and the measuring method is dependent on parameter χ of the loaded vehicle. It respects the wheel forcing of the outer rail in curves due to the height of the centre of gravity and the permissible cant deficiency (see Table 1 to Table 3 of EN 14363:2005).
- extension of acceptance requires compliance to factor λ' ;
- the simplified measuring methods are only applicable for extensions of acceptance with the exception of extension of cant deficiency;

NOTE Operational conditions of freight wagons with static axle loads less than or equal to 225 kN with higher cant deficiency and/or speed also require tests according to EN 14363 with the full test procedure and the normal measuring method.

- the admissible cant deficiency and speed are lower than for the static wheel forces defined in EN 14363;
- for the track loading parameters Q_{qst} and Q new limit values $Q_{qst,limit}$ and $Q_{max,limit}$ are given under the conditions of track design defined in EN 15528.

5.2 Type of on-track test and measuring method

5.2.1 General

For the acceptance of a new freight vehicle with $225 \text{ kN} < 2Q_0 \leq 250 \text{ kN}$ and operational parameters according to Annex B the complete on-track test combined with the normal measuring method defined in EN 14363:2005 is required; the simplified method is not applicable.

For the extension of an acceptance due to changes of design parameters or operation conditions a dispensation from on-track tests or a partial on-track test with the normal or a simplified measuring method can be applied depending on the test results of the accepted vehicle and on the range of modifications of relevant parameters.

NOTE 1 The latter case is possible only if the reference vehicle has already been accepted according to the normal measuring method. Otherwise a new acceptance is necessary.

The extension procedure referred to here is applicable only if the intended admissible cant deficiency (cd_{adm}) is less than or equal to the admissible cant deficiency ($cd_{adm,acceptance}$) for which the vehicle is accepted. Otherwise the full procedure and the normal measuring method shall be applied.

NOTE 2 Tests on vehicles intended for static axle loads higher than 225 kN do not cover load cases with static axle loads less than or equal to 225 kN due to the different operational parameters speed V and cant deficiency cd according to Annex B and EN 14363:2005, Annex G.

5.2.2 Choice of on-track test type

In principle the same procedure as defined in EN 14363:2005, 5.2.1 shall be applied.

For the extension of an acceptance state, Annex A gives the conditions for dispensation or application of partial on-track tests. They depend on the test methods of the initial and the new acceptance as well as on the results achieved during the initial acceptance and the modifications of relevant parameters.

NOTE The conditions for the choice of on-track test type for an extension of an acceptance state are slightly different from EN 14363. They are based on the process described in UIC 518:2009. WG 10 intends to modify EN 14363 accordingly during its revision.

5.2.3 Choice of measuring method

For the extension of an acceptance state, Annex A gives the conditions for the use of the simplified measuring methods including the indication of required axle box force measurement. They depend on the test methods of the initial and the new acceptance as well as on the results achieved during the initial acceptance and the modifications of relevant parameters.

NOTE The conditions for the choice of measuring method for an extension of an acceptance state are slightly different from EN14363. They are based on the process described in UIC 518:2009. WG 10 intends to modify EN 14363 accordingly during its revision.

EN 15687:2010 (E)**5.3 Assessment, limit and measuring values**

All the requirements of EN 14363:2005, 5.3 are applicable except the following track loading limit values (see EN 14363:2005, 5.3.2.3 b) and 5.3.2.3 c):

a) Quasi-static wheel force Q_{qst} :

$Q_{qst,lim} = 155 \text{ kN}$ Scope: Test zones 2, 3 and 4 excluding transition sections

Applicable only for axle loads $225 \text{ kN} < 2Q_0 \leq 250 \text{ kN}$ and

V_{adm} and cd_{adm} according to Annex B

b) Maximum wheel force Q_{max} :

$Q_{max,lim} = 210 \text{ kN}$

Applicable only for axle loads $225 \text{ kN} < 2Q_0 \leq 250 \text{ kN}$ and

V_{adm} and cd_{adm} according to Annex B

NOTE The track loading limit values take account of track work according to class E4 and E5 of EN 15528:2008.

5.4 Performing 'on-track' tests

The test procedure for on-track tests is the same as in EN 14363 taking into account that for freight wagons with axle loads higher than 225 kN and up to 250 kN the speed and cant deficiency are limited to the values given in Annex B (supplement to EN 14363:2005, Annex G).

If during the extension of an acceptance according to 5.2.2 a partial on-track test may be used, the extent of on-track tests can be found in Annex A. It depends on the modifications, the test methods of the initial and the new acceptance as well as on the results achieved during the initial acceptance.

NOTE The required test extent for an extension of an acceptance state is slightly different from EN14363. It is based on the process described in UIC 518:2009 with the deviation that possible restrictions for contact geometry conditions are stated based on the modified parameters. WG 10 intends to modify EN 14363 accordingly during its revision.

5.5 Test evaluation

The test evaluation follows the requirements of EN 14363. For an on-track test according to the normal method the ratio "limit value according to this document / estimated value" of the track loading parameters Q_{qst} and Q shall be calculated for all test zones and test conditions and its lowest value λ' determined.

5.6 Documentation of results

In addition to the documentation of results according to EN 14363 the λ' -value for the track loading shall be reported as well as the new parameter χ (see 1).

Annex A (normative)

Conditions for extension of an acceptance

Table A.1 and Table A.2 define the conditions for an extension of an acceptance.

Table A.1 — Definition of test method and extent depending on initial acceptance

Extension of acceptance Definition of test method and test extent								
Performance of tests for initial approval	Normal method				One of the simplified methods			
General conditions for application of a simplified method	Not to be considered				Fulfilled after modification of parameters			Not fulfilled after modification of parameters
λ (and λ' if relevant)	$\lambda \geq 1,1$ (and $\lambda' \geq 1,0$ if relevant)			$\lambda < 1,1$ (and/or $\lambda' < 1,0$ if relevant)	$\lambda \geq 1,1$		$\lambda < 1,1$	Not considered
Modified parameters	All inside the range defined in column 2a	All inside the range defined in column 2b	Some outside the range defined in column 2b	Not considered for the definition of the test method	All inside the range defined in column 2a	All inside the range defined in column 2b	Some outside the range defined in column 2b	Not considered
Test method and extent	Test dispensation	Simplified method with extent defined in columns 3a-e depending on the modified parameters	Normal method with extent defined in columns 3a-e depending on the modified parameters	Test dispensation	Simplified method with extent defined in columns 3a-e depending on the modified parameters			Normal method with extent defined in columns 3a-e depending on the modified parameters