



**SLOVENSKI STANDARD**  
**oSIST prEN 16910:2015**  
**01-september-2015**

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**Železniške naprave - Vozna sredstva - Zahteve za neporušitveno preskušanje na tekalnih sestavah pri vzdrževanju železnice**

Railway applications - Rolling stock - Requirements for non-destructive testing on running gear in railway maintenance

Bahnanwendungen - Schienenfahrzeuge - Anforderungen an die zerstörungsfreie Prüfung an Fahrwerken in der Instandhaltung

Applications ferroviaires - Matériel roulant - Exigences pour les essais non destructifs sur les organes de roulement lors de la maintenance ferroviaire

**Ta slovenski standard je istoveten z: prEN 16910**

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45.060.01	Železniška vozila na splošno	Railway rolling stock in general
45.120	Oprema za gradnjo in vzdrževanje železnic oz. žičnic	Equipment for railway/cableway construction and maintenance

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EUROPEAN STANDARD  
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**prEN 16910**

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ICS

English Version

## Railway applications - Rolling stock - Requirements for non-destructive testing on running gear in railway maintenance

Applications ferroviaires - Matériel roulant - Exigences pour les essais non destructifs sur les organes de roulement lors de la maintenance ferroviaire

Bahnanwendungen - Schienenfahrzeuge - Anforderungen an die zerstörungsfreie Prüfung an Fahrwerken in der Instandhaltung

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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prEN 16910:2015 (E)

## Foreword

This document (prEN 16910:2015) 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.

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(s).

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

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## Introduction

For many years, Non Destructive Testing (NDT) has been used on European networks to control the in service condition of running gears through maintenance processes in order to guarantee the safety during trainset operations.

The two maintenance standards (EN 15313 Wheelsets Maintenance and EN 15827 Bogies) require appropriately trained and capable personnel undertaking these NDT maintenance tasks (see EN ISO 9712).

The purpose of this document is to describe the necessary requirements additional to the existing standards to promote safety, interoperability and cross acceptance.

A sound Maintenance Plan for Rolling Stock helps guarantee safe operation of railway vehicles at the right cost. It deals with wear, unintended damage or malfunction, and takes into account the vehicles usage and the track conditions. In this context, NDT are used to search for running gear faults and failures.

For running gear, the defects are most often, fatigue cracks located either at surface when it is free or at seat surface, or in sub-surface where pressure contact load applies.

NDT surface methods like MT or ET are preferred in proof of defects on free surfaces if the area examined is accessible.

For volume defects or non-visible non-accessible surfaces for example seats in mounted wheel sets the only usable method is UT.

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**prEN 16910:2015 (E)****1 Scope**

This European Standard provides the specific requirements for NDT of Wheelset for:

- in-service inspection;
- off-vehicle inspection;

and guidance for the introduction of new NDT Techniques.

NOTE In addition examples are given in informative annexes for:

- NDT Personnel Certification (incl. training, qualification, renewal),
- NDT Procedure and Instruction

For this standard, the following NDT methods considered are:

- ultrasound testing (UT);
- magnetic particle testing (MT);
- eddy current testing (ET).

Other methods considered in EN ISO 9712 are outside the scope of this standard.

For this purpose, a catalogue of the common defects is given as guidance.

For application of this standard, the definition of the “Wheelset Class” is given and attached to the Railway Maintenance Sector as named in EN ISO 9712.

Specific NDT requirements for infrastructure or requirements relating to the quality of new products delivered by manufacturers are not within the scope of this 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 13261, *Railway applications – Wheelset and Bogies — Axles product requirements*

EN 15313, *Railway applications — In-service wheelset operation requirements — In-service and off-vehicle wheelset maintenance*

EN ISO 9712:2012, *Non-destructive testing — Qualification and certification of NDT personnel (ISO 9712:2012)*

ISO/TR 25107, *Non-destructive testing — Guidelines for NDT training syllabuses*



### 3 Terms and definitions

#### 3.1

##### **non-destructive tests**

##### **NDT**

non-destructive testing is the process of examination of a component to enable its integrity to be assessed by a means which does not compromise the service life or design life of the component

#### 3.2

##### **indication**

representation or signal from a discontinuity in the format allowed by the NDT method used

[SOURCE: EN 1330-2:1998, definition 2.12]

#### 3.3

##### **defect**

indication which may prevent the component from fulfilling its designed purpose

#### 3.4

##### **acceptance or rejection criteria**

criteria against which the specimen is examined in order to determine its acceptability / rejectability

[SOURCE: EN 1330-2:1998, definition 2.1]

#### 3.5

##### **cracks**

2-D discontinuity of the material resulting from thermal, chemical or mechanical action

#### 3.6

##### **NDT instruction**

written description of the precise steps to be followed in testing to an established standard, code, specification or NDT procedure

[SOURCE: EN ISO 9712:2012, definition 19]

#### 3.7

##### **NDT method**

discipline applying a physical principle in non-destructive testing

[SOURCE: EN ISO 9712:2012, definition 20]

#### 3.8

##### **NDT procedure**

written description of all essential parameters and precautions to be applied when non destructively testing products in accordance with standard(s), code(s) or specification(s)

[SOURCE: EN ISO 9712:2012, definition 21]

#### 3.9

##### **NDT technique**

specific way of utilizing an NDT method

[SOURCE: EN ISO 9712:2012, definition 22]

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## 3.10

**NDT training**

process of instruction in theory and practise in the NDT method in which certification is sought, which takes the form of training courses to a syllabus approved by the certification body, but which does not include the use of the specimens used in qualification examinations

[SOURCE: EN ISO 9712:2012, definition 23]

## 3.11

**semi-automated equipment**

equipment where part of the testing is supported by a machine

Note 1 to entry: Scan reading and interpretation remains with the operator

## 4 Railway Maintenance Sector

For the purposes of application of this standard the two following classes may be defined:

- wheelsets (wheels, solid or hollow axles, bearings);
- bogies and connecting components (bogie frames, equalising beams, rods, suspension gear, buffing and draw gear).

These two classes are part of the Rolling Stock sub-sector as shown in Figure 1.

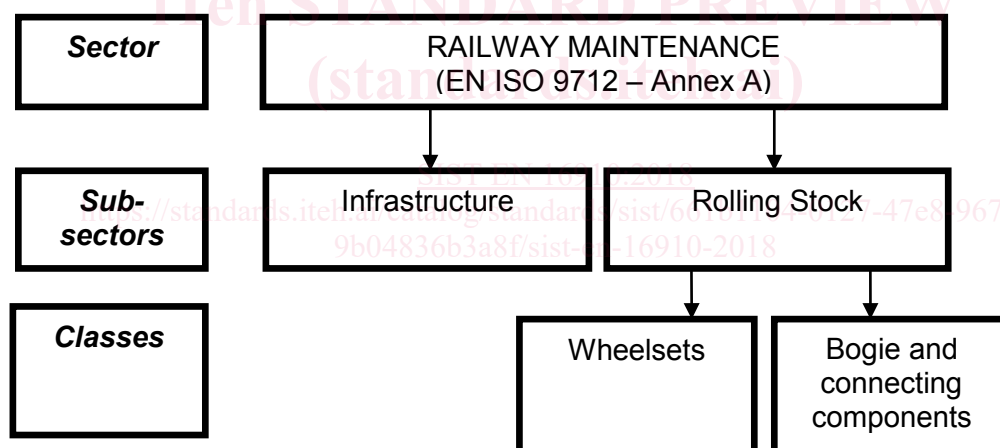


Figure 1 — Sector, sub-sector and classes

## 5 Requirements for NDT personnel

### 5.1 General

For the Class “Wheelsets” and for NDT personnel shall have relevant knowledge and skills acquired through an appropriate process. An example of such a process is given in the Informative Annex A.

Any organization offering the training, examination and acceptance of experience should be checked against the conformity with the requirements of this standard by a body independent of the company.

## 5.2 Training

### 5.2.1 Training contents for class “Wheelsets”

The training required for each different NDT methods shall include both specific railway theoretical and practical training.

EN ISO 9712 and ISO/TR 25107 apply. An example of the minimum length of training required and information on experience and additional requirements is given in the Informative Annex B.

## 6 In-service and off-vehicle NDT requirements for maintenance

### 6.1 General Principles

The NDT Plan Design Justification File (PDJF) is part of the Maintenance Design Justification File, set out in compliance with EN 15313.

An NDT plan is defined taking into account other planned maintenance activities, return of experience, component design and maintenance documentation in order to ensure that the component will be used in-service in a safe condition.

The activities in the NDT Plan are defined through a process that shall be documented in a NDT Plan Design Justification File (NDT-PDJF).

Establishing a PDJF file is a collaborative process.

A level 3 should be part of this process (see Annex B).

### 6.2 Requirements for the NDT Plan

NDT-Plan file shall include:

- the frequency of examinations;
- the NDT Method and procedures;
- the definition of the areas to be tested;
- the examination technique and the instructions used to perform the NDT;
- the resources needed (equipment and NDT personnel) to perform the NDT activities, and
- the decision criteria.

In order to minimize the out-of-service time of the rolling stock material, the frequency of examination should correspond with other maintenance activities planned intervals.

### 6.3 The NDT Plan Design Justification File (NDT-PDJF)

#### 6.3.1 Scope

Scope of the NDT PDJF is:

- to describe criteria and methods used to design the NDT Plan for the component;
- to motivate the necessity (or not, in comparison to similar components) to perform periodic or condition based or linked to another maintenance operation, NDT examination on the component;

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- to document the input elements and relevant data used to design the NDT Plan such as statistics from return of experience, tests, investigations, calculations.

**6.3.2 Requirements**

The following areas shall be addressed:

- material characteristics;
- stresses and fatigue limits on the component in service;
- environmental conditions on the component;
- risk of surface degradation of the component in service;
- particular service conditions;
- return of experience from similar applications.

**6.4 Definitions and defects catalogue and associated NDT methods****6.4.1 General**

In this document, the NDT-plan is designed to search for cracks and defects.

For Axles, Wheels and Bearing that comply with EN standards (EN 13103, EN 13104, EN 13260, EN 13261, EN 13262), the manufacturing defects are not considered.

For the other Axles and Wheels manufacturing defects may be considered

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