

ICS 45.040

English Version

**Railway applications - Wheelsets and bogies - Monobloc wheels  
- Technical approval procedure - Part 2: Cast wheels**

Applications ferroviaires - Essieux montés et bogies -  
Roues monobloc - Procédure d'homologation technique -  
Partie 2: Roues en acier moulé

Bahnanwendungen - Radsätze und Drehgestelle - Vollräder  
- Technische Zulassungsverfahren - Teil 2: Gussräder

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## Foreword

This document (CEN/TS 13979-2:2011) has been prepared by Technical Committee CEN/TC 256 "Railway applications", the secretariat of which is held by DIN.

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This document has been prepared as part of a mandate given to CEN by the European Commission and the European Free Trade Association and provides support for the main requirements of EU Directive 2008/57/CE.

This European Standard is part of a series *Railway applications — Wheelsets and bogies — Monobloc wheels — Technical approval procedure* which consists of the following parts:

- *Part 1: Forged and rolled wheels;*
- *Part 2: Cast wheels.*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Cyprus, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Iceland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

## Introduction

Part 1 of this series applies to monobloc wheels manufactured by forging and rolling. This process was the only authorized process accepted in the UIC regulations that were applicable in the recent past in most of the European countries.

Cast wheels are commonly used by AAR networks and have been introduced into Europe on some applications for freight wagons. This standard defines the specified requirements linked to the casting process for the technical approval of a monobloc wheel. It follows the same methodology as Part 1.

As this standard applies only to freight wagons and supports European interoperability, this standard defines in the informative Annex F the specific parameters for the thermomechanical assessment of a freight wagon wheel designed for European interoperability.

The standard describes how to assess the wheel design. To be able to apply the specifications, it is essential to define the use of the wheel; this standard also states how to define this use.

At least four aspects are described with different purposes:

- a geometric aspect: to allow interchangeability of different solutions for the same application;
- a thermomechanical aspect: to manage wheel deformations and to ensure that braking will not cause wheels to break;
- a mechanical aspect: to ensure that no fatigue cracks occur in the web;
- an acoustic aspect: to ensure that the solution chosen is as good as the reference wheel, for the use in question.

For each of these three latter aspects, the rules proposed tend to limit the procedure; thus, the easier the objectives are to attain by the wheel under study.

This Technical Specification does not cover assessment of the hub nor of the static mechanical dimensioning of the wheel.

The main content of this standard is derived from Part 1. The only technical differences are linked to the needs of the cast process for the product.

## 1 Scope

This Technical Specification defines the requirements for a cast monobloc wheel of a freight railway vehicle non-powered axle for use on a European network.

It only applies to wheels of new design or new European application.

These requirements are intended to assess the validity of the design choice for the proposed use.

The assessment of these requirements is the technical approval procedure.

This Technical Specification does not address the quality requirements for cast wheels. These quality requirements are defined in Technical Specification CEN/TS 15718.

## 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 reference document (including any amendments) applies.

EN 13103, *Railway applications — Wheelsets and bogies — Non-powered axles — Design method*

CEN/TS 15718, *Railway applications — Wheelsets and bogies — Product requirements for cast wheels*

## 3 Parameters for the definition of the application covered

The application for which the wheel is to be approved shall be defined by the following parameters.

If the application parameters are changed for an approved wheel, the customer and supplier shall review the assessments.

### 3.1 Parameters for geometric interchangeability

The application shall be defined by geometric interchangeability parameters divided into three categories according to whether they are linked to functional, assembly or maintenance requirements.

#### 3.1.1 Functional requirements

- the nominal tread diameter that influences the buffer height and the loading gauge;
- the maximum rim width linked to the points and crossing and the track brakes;
- the tread profile outside the conical part of the tread;
- the position of the rim internal surface relative to the corresponding surface of the hub;
- the conicity of the hub bore;
- the space required for disc brakes mounted on the wheel;
- the space needed on the bogie frame, braking equipment and suspension equipment.