TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN/TS 15427-2-3

October 2023

ICS 45.040

Supersedes CEN/TS 15427-2-3:2021

English Version

Railway applications - Wheel/rail friction management - Part 2-3: Properties and Characteristics - Adhesion materials

Applications ferroviaires - Gestion du frottement roue/rail - Partie 2-3: Propriétés et Caractéristiques - Matériau d'Adhésion

Bahnanwendungen - Reibungsmanagement zwischen Rad und Schiene - Teil 2-3: Eigenschaften und Merkmale - Kraftschlusserhöhende Materialien

This Technical Specification (CEN/TS) was approved by CEN on 23 July 2023 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. CEN/TS 15427-2-3:2023 E

Contents

Page

European foreword

This document (CEN/TS 15427-2-3:2023) has been prepared by Technical Committee CEN/TC 256 “Railway Applications”, the secretariat of which is held by DIN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN/TS 15427-2-3:2021.

This document has been prepared under a Standardization Request addressed to CEN by the European Commission.

This document is part of the following series:

— *EN 15427-1-1, Railway applications - Wheel/Rail friction management - Part 1-1: Equipment and Application – Flange lubrication*

— CEN/TS 15427-1-2, Railway applications - Wheel/Rail friction management - Part 1-2: Equipment and Application – Top of Rail materials

— CEN/TS 15427-1-3, Railway applications - Wheel/Rail friction management - Part 1-3: Equipment and Application – Adhesion materials

— EN 15427-2-1, Railway applications - Wheel/Rail friction management - Part 2-1: Properties and Characteristics – Flange lubricants

— CEN/TS 15427-2-2, Railway applications - Wheel/Rail friction management - Part 2-2: Properties and Characteristics – Top of Rail materials

— CEN/TS 15427-2-3, Railway applications - Wheel/Rail friction management - Part 2-3: Properties and Characteristics – Adhesion materials

— CEN/prTR 15427-3, Railway applications - Wheel/Rail friction management - Part 3: Rationale for requirements and further background information

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this Technical Specification: 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

Friction management using solid or fluid (oil, grease, etc.) substances at the wheel-rail interface is a complex subject and includes the following aspects:

— lubrication of the wheel flange/ rail gauge corner interface, commonly referred to as “flange or rail lubrication”;

— lubrication of the back of flange/ check rail interface; commonly referred to as “check rail lubrication”;

— controlling the level of friction at the interface between the top of rail and the wheel tread, commonly referred to as “top of rail friction management”;

— altering the level of adhesion at the interface between the top of rail and the wheel tread.

This document sets out requirements for the material to be used for adhesion management. It specifies requirements for the material, how to test it and how to approve it.

The adhesion material should be tested to confirm there is:

— compatibility with top of rail systems;

— no intolerable increased risk of fire;

— no harmful environmental effects;

— no incompatibility between the different materials in use, particularly between solid and fluid systems;

— satisfactory and consistent product quality and performance;

— no degradation to the safety of the railway (braking, signalling, derailment).

The main purpose of an adhesion material is to condition the wheel/ rail contact to either prevent the occurrence of slipping or sliding or to enable recovery of traction/ braking where slipping or sliding occurs.

1 Scope

This document specifies the requirements of adhesion materials intended to be applied to the interface between the wheel tread and the rail crown (active interface). It can be applied either directly or indirectly to the wheel tread or rail.

It outlines the information required for most approval procedures, the method of testing and routine control/monitoring of the material.

This document does not deal with Top of Rail materials. For Top of Rail materials see CEN/TS 15427-2-2:2023.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 933-1, *Tests for geometrical properties of aggregates - Part 1: Determination of particle size distribution - Sieving method*

EN 1097-3, *Tests for mechanical and physical properties of aggregates - Part 3: Determination of loose bulk density and voids*

EN 1097-6, *Tests for mechanical and physical properties of aggregates - Part 6: Determination of particle density and water absorption*

EN 1097-5, *Tests for mechanical and physical properties of aggregates - Part 5: Determination of the water content by drying in a ventilated oven*

EN 1744-1, *Tests for chemical properties of aggregates - Part 1: Chemical analysis*

EN 13755, *Natural stone test methods - Determination of water absorption at atmospheric pressure*

ISO 2049, *Petroleum products - Determination of colour (ASTM scale)*

ISO 6072, *Rubber - Compatibility between hydraulic fluids and standard elastomeric materials*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
adhesion material
substance that is used to either prevent the occurrence of slipping or sliding or to enable recovery of traction/ braking where slipping or sliding occurs