PD CEN/TS 15427-2-2:2023

BSI Standards Publication

Railway applications — Wheel/ rail friction management

Part 2-2: Properties and characteristics — Top of rail materials

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National foreword

This Published Document is the UK implementation of CEN/TS 15427-2-2:2023. It supersedes PD CEN/TS 15427-2-2:2021, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee RAE/3/-/6, Railway applications - Wheel/rail friction management.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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English Version

Railway applications - Wheel/rail friction management - Part 2-2: Properties and characteristics - Top of rail materials

Applications ferroviaires - Gestion des frottements roue/rail - Partie 2-2 : Propriétés et caractéristiques - Lubrifiants de tête de rail

Bahnanwendungen - Reibungsmanagement zwischen Rad und Schiene - Teil 2-2: Eigenschaften und Merkmale - Kraftschlussmodifikatoren

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

Contents

Page

European foreword

This document (CEN/TS 15427-2-2:2023) 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 15427-2-2:2021.

CEN/TS 15427-2-2:2023 includes the following significant technical changes with respect to CEN/TS 15427-2-2:2021:

— document has been editorially updated based on the feedback received on the previous edition;

— corrections and clarifications have been introduced based on the feedback received on the previous edition;

— consistency with the other parts of the series has been improved.

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 on the top of rail. It specifies requirements for the material, how to test it and how to approve it.

The material for top of rail should be tested to confirm there is:

— compatibility with top of rail material applicator equipment;

— no intolerable increased risk of fire;

— no harmful environmental effects;

— no incompatibility between the different materials, lubricants 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, electrical traction return).

The main purpose of a top of rail material is to influence the interface between the wheel and rail (referred to as the third body layer) to control friction to a level where a reduction in noise or wear can be realized.

1 Scope

This document specifies the requirements of 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 adhesion materials, for example:

— sand;

— adhesion enhancers.

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 ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868)*

EN ISO 2160, *Petroleum products — Corrosiveness to copper — Copper strip test (ISO 2160)*

EN ISO 2592, *Petroleum and related products — Determination of flash and fire points - Cleveland open cup method (ISO 2592)*

EN ISO 3104, *Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity (ISO 3104)*

EN ISO 3146, *Plastics — Determination of melting behaviour (melting temperature or melting range) of semi-crystalline polymers by capillary tube and polarizing-microscope methods (ISO 3146)*

EN ISO 3675, *Crude petroleum and liquid petroleum products — Laboratory determination of density — Hydrometer method (ISO 3675)*

EN ISO 4589-1, *Plastics — Determination of burning behaviour by oxygen index — Part 1: General requirements (ISO 4589-1)*

EN ISO 4589-2, *Plastics — Determination of burning behaviour by oxygen index — Part 2: Ambient-temperature test (ISO 4589-2)*

EN ISO 5659-1, *Plastics — Smoke generation — Part 1: Guidance on optical-density testing (ISO 5659-1)*

EN ISO 5659-2, *Plastics — Smoke generation — Part 2: Determination of optical density by a single-chamber test (ISO 5659-2)*

EN ISO 9439, *Water quality — Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium — Carbon dioxide evolution test (ISO 9439)*

EN ISO 12185, *Crude petroleum and petroleum products — Determination of density — Oscillating U-tube method (ISO 12185)*