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**Railway applications - Wheel/rail friction management -
Lubricants for trainborne and trackside applications**

EESTI STANDARDI EESSÕNA

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ICS 45.040; 75.100

English Version

Railway applications - Wheel/rail friction management - Lubricants for trainborne and trackside applications

Applications ferroviaires - Gestion des frottements roue/rail
- Lubrifiants pour les applications embarquées et fixes de
voie

Bahnanwendungen - Spurranzschmierung - Prüfung der
Schmierstoffe

This European Standard was approved by CEN on 9 June 2012.

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Foreword

This document (EN 16028:2012) 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of an identical text or by endorsement, at the latest by January 2013, and conflicting national standards shall be withdrawn at the latest by January 2013.

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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 (active interface), commonly referred to as “flange or rail lubrication”;
- friction modification of the top of rail/wheel tread interface, commonly referred to as “top of rail friction management”.

This European Standard sets out requirements for the lubricant for flange or rail lubrication. It specifies requirements for the lubricant, how to test it and how to approve it.

Lubricants should be tested to confirm there is:

- compatibility with lubricating systems;
- no intolerable increased risk of fire;
- no harmful environmental effects;
- no incompatibility between the different lubricants in use, particularly between solid and fluid systems;
- satisfactory and consistent product quality and performance.

The main purpose of the lubricant is to reduce friction and wear, and keep them at an acceptable level.

The content is based on current experience and should not exclude developments that can be later incorporated at reissue.

1 Scope

This European Standard specifies the requirements of lubricants intended for lubrication of the wheel-rail interface between the wheel flange and the rail gauge corner (active interface) applied either directly or indirectly to the wheel flange or to the rail to achieve an acceptable level of friction and wear.

It covers the approval procedure, the method of testing and routine control/monitoring of the lubricant.

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 10130, *Cold rolled low carbon steel flat products for cold forming — Technical delivery conditions*

EN 15427, *Railway applications — Wheel/rail friction management — Flange lubrication*

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

EN ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1)*

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

EN ISO 2592, *Petroleum 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: Guidance (ISO 4589-1)*

EN ISO 4589-2, *Plastics — Determination of burning behaviour by oxygen index — 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 — Determination of optical density by a single-chamber test (ISO 5659-2)*

ISO/TR 5659-3, *Plastics — Smoke generation — Part 3: Determination of optical density by a dynamic-flow method*

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

EN ISO 20623, *Petroleum and its products — Determination of the extreme-pressure and anti-wear properties of fluids — Four ball method (European conditions) (ISO 20623)*

ISO 760, *Determination of water — Karl Fischer method (General method)*

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

ISO 2137, *Petroleum products and lubricants — Determination of cone penetration of lubricating greases and petrolatum*

ISO 2176, *Petroleum products — Lubricating grease — Determination of dropping point*

ISO 3016, *Petroleum products — Determination of pour point*

ISO 3733, *Petroleum products and bituminous materials — Determination of water — Distillation method*

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

ISO 6743-99, *Lubricants, industrial oils and related products (class L) — Classification — Part 99: General*

ISO 7120, *Petroleum products and lubricants — Petroleum oils and other fluids — Determination of rust-preventing characteristics in the presence of water*

ISO 9772, *Cellular plastics — Determination of horizontal burning characteristics of small specimens subjected to a small flame*

ISO 11007, *Petroleum products and lubricants — Determination of rust-prevention characteristics of lubricating greases*

DIN 51350-4, *Testing of lubricants — Testing by the Shell four-ball tester — Determination of welding load of consistent lubricants*

DIN 51350-5, *Testing of lubricants — Testing by the Shell four-ball tester — Determination of wear data for consistent lubricants*

DIN 51398, *Testing of lubricants — Procedure for measurement of low temperature apparent viscosity by means of the Brookfield viscometer (liquid bath method)*

DIN 51418-1, *X-ray spectrometry — X-ray emissions and X-ray fluorescence analysis (XRF) — Part 1: Definitions and principles*

DIN 51418-2, *X-ray spectrometry — X-ray emissions and X-ray fluorescence analysis (XRF) — Part 2: Definitions and basic principles for measurements, calibration and evaluation of results*

DIN 51451, *Testing of petroleum products and related products — Analysis by infrared spectrometry — General working principles*

DIN 51631, *Mineral spirits — Special boiling point spirits — Requirements*

DIN 51777-2, *Testing of mineral oil-hydrocarbons and solvents — Determination of the water content according to Karl Fischer (indirect method)*

DIN 51805, *Testing of lubricants — Determination of flow pressure of lubricating greases — Kesternich method*

DIN 51807-1, *Testing of lubricants — Test of the behaviour of lubricating greases in the presence of water — Static test*

DIN 51810-1, *Testing of lubricants — Determination of shear viscosity of lubricating greases by the rotational viscosimeter — Part 1: System of cone / plate*

DIN 51811, *Testing of lubricants — Testing of corrosiveness to copper of greases — Copper strip tarnish test*

DIN 51817, *Testing of lubricants — Determination of oil separation from greases under static conditions*

DIN 51820-1, *Testing of lubricants — Analysis of greases by infrared spectrometry — Taking and evaluating an infrared spectrum*

ASTM D1831, *Standard Test Method for Roll Stability of Lubricating Grease*

ASTM D4049, *Standard Test Method for Determining the Resistance of Lubricating Grease to Water Spray*

IP 396, *Determination of dropping point of lubricating grease — Automatic apparatus method*

OECD 301 suite

OECD Document	Equivalent Standard
301a	EN ISO 7827, <i>Water quality — Evaluation in an aqueous medium of the 'ultimate' aerobic biodegradability of organic compounds — Method by analysis of dissolved organic carbon (DOC) (ISO 7827)</i>
301b	EN ISO 9439, <i>Water quality — Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium — Carbon dioxide evolution test (ISO 9439)</i>
301c	Nil
301d	EN ISO 10707, <i>Water quality — Evaluation in an aqueous medium of the 'ultimate' aerobic biodegradability of organic compounds — Method by analysis of biochemical oxygen demand (closed bottle test) (ISO 10707)</i>
301e	EN ISO 7827, <i>Water quality — Evaluation in an aqueous medium of the 'ultimate' aerobic biodegradability of organic compounds — Method by analysis of dissolved organic carbon (DOC) (ISO 7827)</i>
301f	EN ISO 9408, <i>Water quality — Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium by determination of oxygen demand in a closed respirometer (ISO 9408)</i>