TECHNICAL SPECIFICATION

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CLC/TS 50537-1

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English version

Railway applications - Mounted parts of the traction transformer and cooling system - Part 1: HV bushing for traction transformers

Applications ferroviaires - Accessoires des transformateurs de traction et systèmes de refroidissement - Partie 1: Traversées haute tension pour transformateurs de traction

Bahnanwendungen - Anbauteile des Haupttransformators und Kühlsystems - Teil 1: Hochspannungsdurchführung für Haupttransformatoren

This Technical Specification was approved by CENELEC on 2010-01-22.

CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

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Foreword

This Technical Specification was prepared by Working Group 23 of SC 9XB, Electromechanical material on board of rolling stock, of Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways.

It was circulated for voting in accordance with the Internal Regulations, Part 2, Subclause 11.3.3.3 and was accepted as a CENELEC Technical Specification on 2010-01-22.

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

The following date was fixed:

– latest date by which the existence of the CLC/TS has to be announced at national level (doa) 2010-07-22

The CLC/TS 50537 series "*Railway applications – Mounted parts of the traction transformer and cooling system*" consists of four different parts:

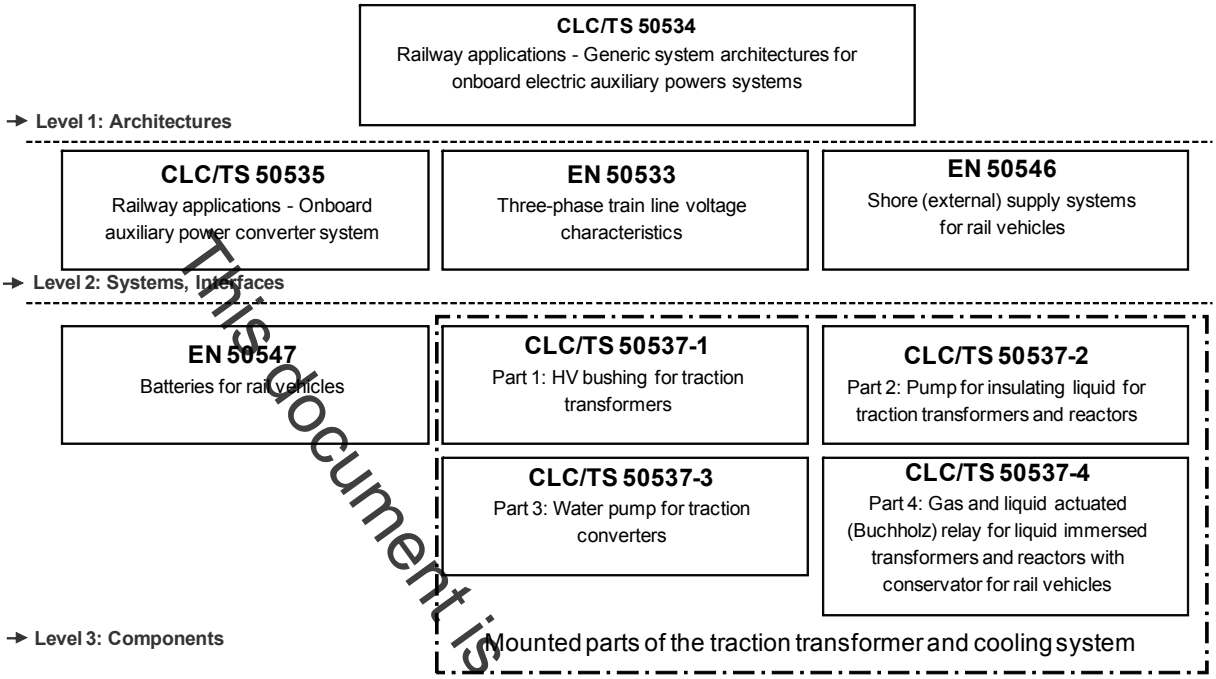
- Part 1: HV bushing for traction transformers;
- Part 2: Pump for insulating liquid for traction transformers and reactors;
- Part 3: Water pump for traction converters;
- Part 4: Gas and liquid actuated (Buchholz) relay for liquid immersed transformers and reactors with conservator for rail vehicles.

The CLC/TS 50537 series shall be read in conjunction with CLC/TS 50534 [1)] "*Railway applications – Generic system architectures for onboard electric auxiliary power systems".*

This standardization project was derived from the EU-funded Research project MODTRAIN (MODPOWER). It is part of a series of standards, referring to each other. The hierarchy of the standards is intended to be as follows:

1) Under development.

Overview on the technical framework
CLC/TS 50534 defines the basis for other depending standards



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1 Scope

This Technical Specification is applicable to high voltage (HV) bushings, intended for use in traction transformers of rail vehicles, cooled by insulating liquid with rated voltages up to 25 kV single phase and rated currents up to 630 A at frequencies from 16,7 Hz to 60 Hz.

HV bushings within the scope of this Technical Specification are bushings for separable connectors that connect the power supply coming from a contact wire or from a contact rail to the primary winding of the traction transformer. The Technical Specification only deals with HV bushings that are mounted to the transformer.

CLC/TS 50537-1 gives consideration to both technical and normative requirements of the railway environment and restricts the variety provided by industry-wide standards for bushings, such as EN 50180 and EN 60137. It determines requirements and tests enabling the interchangeability especially regarding electrical and mechanical interfaces. Furthermore, service conditions are described.

The cable plug as the counterpart of the HV bushing's plug-in end is not covered by this Technical Specification.

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 referenced document (including any amendments) applies.

TS 45545 (series):2009 [2)]	Railway applications – Fire protection on railway vehicles
CLC/TS 50534 [3)]	Railway applications – Generic system architecture for onboard electric auxiliary power systems
EN 50124-1:2001 + A1:2003 + A2:2005	Railway applications – Insulation coordination – Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment
EN 50125-1:1999	Railway applications – Environmental conditions for equipment – Part 1: Equipment on board rolling stock
EN 50163:2004 + A1:2007	Railway applications – Supply voltages of traction systems
EN 50180:1997	Bushings above 1 kV up to 36 kV and from 250 A to 3,15 kA for liquid filled transformers
EN 50388:2005	Railway applications – Power supply and rolling stock – Technical criteria for the coordination between power supply (substation) and rolling stock to achieve interoperability
EN 60068-2-14:2009	Environmental testing – Part 2-14: Tests – Test N: Change of temperature (IEC 60068-2-14:2009)
EN 60137:2008	Insulated bushings for alternating voltages above 1 000 V (IEC 60137:2008)

2) Part 5 is of CENELEC origin – Other parts are from CEN.

3) Under development.

EN 60310:2004	Railway applications – Traction transformers and inductors on board rolling stock (IEC 60310:2004)
EN 60529:1991 + A1:2000	Degrees of protection provided by enclosures (IP code) (IEC 60529:1989 + A1:1999)
EN 60721-3-5:1997	Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 5: Ground vehicle installations (IEC 60721-3-5:1997)
EN 61006:2004	Electrical insulating materials – Methods of test for the determination of the glass transition temperature (IEC 61006:2004)
EN 61373:1999	Railway applications – Rolling stock equipment – Shock and vibration test (IEC 61373:1999)
IEC 60050-551:1998	International Electrotechnical Vocabulary – Part 551: Power electronics
ISO 2859-1:1999 + Cor 1:2001	Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-551:1998 and the following apply.

3.1.1
HV bushing
device mounted to the traction transformer which connects the power supply coming from a contact wire or a contact rail to the primary winding of the traction transformer

3.1.2
bushing for separable connector
plug-in type bushing. One end of the bushing is immersed in an insulating medium and the other end designed to receive a separable insulated cable connector, without which the bushing cannot function

[see also EN 60137]

3.1.3
overvoltage
any voltage having a peak value exceeding the corresponding peak value of maximum steady-state voltage at normal operating conditions

[EN 50124-1]

3.1.4
temporary overvoltage
overvoltage of relatively long duration due to voltage variations

[EN 50124-1]

3.1.5
transient overvoltage
short duration overvoltage of a few milliseconds or less due to current transfer

[EN 50124-1]