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Methods of determination of the mechanical properties of self-bonding coating assemblies related to non-oriented electrical steels

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English Version

Methods of determination of the mechanical properties of self-bonding coating assemblies related to non-oriented electrical steels

Méthodes de détermination des caractéristiques mécaniques des assemblages à base de vernis thermocollant dédiés aux aciers électriques à grains non orientés

Verfahren zur Bestimmung der mechanischen Eigenschaften von Backlackverbunden bezogen auf nicht kornorientiertes Elektroband und -blech

This Technical Report was approved by CEN on 12 February 2024. It has been drawn up by the Technical Committee CEN/TC 459/SC 8.

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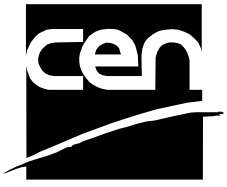

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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

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European foreword

This document (CEN/TR 18048:2024) has been prepared by Technical Committee CEN/TC 459/SC 8 “Steel sheet and strip for electrical applications”, the secretariat of which is held by DIN.

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Introduction

EN 10342 describes the electrical steel coating types. The electrical steels ordered according to standards EN 10106, EN 10265, EN 10303, EN 10341 are supplied either with or without such a coating. CEN/TR 18048 describes the measurements necessary to qualify these coatings.

The particular case of self-bonding coatings (also called bondable coatings) have as additional specification, beyond providing an insulation layer, to assure a glued connection between superposed laminations. This implies the strength of this bonded assembly needs to be assessed, for qualification purposes. This multi-material assembly needs specific precautions for establishing its mechanical strength level. Different standards exist, but these are not necessarily dedicated to electrical steel coatings. The lack of a clear description of which evaluation method to use, with which calibration methods, sample preparation, etc. brings inconsistency in obtained measurement results. The purpose of this technical report is to overcome the problem of differences in mechanical assessment of self-bonding coating assemblies, by combining the aspects of Non-Oriented Electrical Steel self-bonding coating mechanical testing in a clear guideline. This does not involve the mechanical testing of the coating itself, nor the mechanical testing of the electrical steel itself.

These self-bonding coating types are used in different electric machine applications such as: wind generators, high efficiency industry machines, automotive traction motors.

1 Scope

This document describes the mechanical testing methods, relevant for self-bonding coating assemblies with non-oriented electrical steels. In particular, it describes the mechanical testing methods, sample preparation, calibration methods, necessary to obtain reliable results that can be considered a reference for quality evaluation.

This document applies only to self-bonding coatings of non-oriented electrical steels. The tests can be performed regardless of the time lapse between the coated electrical steel production and the evaluation of the bonding process of the assembled stack.

2 Normative references

There are no normative references in this document.