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English Version

**Guidelines for the use of EN 45545-2 for Ni-Cd batteries on
board rolling stock**

Lignes directrices pour l'utilisation de l'EN 45545-2 pour les
batteries NiCd à bord matériel roulant

Leitfaden für die Verwendung von EN 45545-2 für Nickel-
Cadmium-Batterien auf Bahnfahrzeugen

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European Foreword

This document (CLC/TR 50718:2021) has been prepared by CLC/TC 9X “Electrical and electronic applications for railways”.

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Introduction

The design, verification and testing of Ni-Cd batteries on board rolling stock is standardized by EN 50547, which refers to the EN 45545 series and particularly to EN 45545-2:2013+A1:2015 in the clause “Fire behaviour requirements”.

However, the referred series deals with the Ni-Cd batteries in a generic and limited way:

- EN 45545-2:2013+A1:2015 deals with Ni-Cd batteries as a non-listed products.

As a consequence, the application of the EN 45545 series to the case of Ni-Cd batteries on board of trains opens the door to very different interpretations.

Designers, assessors, producers and customers have very different points of view which could result in problematic aspects which are difficult to be fixed and agreed upon.

In order to overcome such situations, TC9X decided to set up the Survey Group CLC TC9X WG31 with the task to prepare a new standard; the SG31 proposes in the meantime to issue guidelines for the application of the EN 45545 series in case of Ni-Cd batteries on board rolling stock.

This document has been prepared according to the decision 58/12 taken during the TC9X Plenary meeting and the following approved NWIP, see document BT166/DG11706/DL.

This document is a report of the available experience and best practice in applying the EN 45545 series to the case of Ni-Cd batteries on board rolling stock.

1 Scope

The scope of this document is to guide users of the EN 45545 series, particularly EN 45545-2:2013+A1:2015 and EN 45545-5:2013+A1:2015, in the application of these standards in designing and assessing Ni-Cd batteries on board trains for their fire protection measures.

The scope of this document excludes any new requirements, considering only the requirements stated by the above listed standards.

However, EN 45545 being generic requirements and not specifically referring to Ni-Cd batteries, this guide helps the application for those batteries.

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 45545-1:2013, *Railway applications - Fire protection on railway vehicles - Part 1: General*

EN 45545-2:2013+A1:2015, *Railway applications - Fire protection on railway vehicles - Part 2: Requirements for fire behaviour of materials and components*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 45545-1:2013 apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

4 Main aspects and requirements of EN 45545-2 addressed by this guide

4.1 General

This clause reports the list of aspects and requirements which are stated by EN 45545-2:2013+A1:2015 and EN 45545-5:2013+A1:2015 and which need clarification and guiding in case of application to Ni-Cd cells and batteries.

4.2 Need of clarification and suggested methodological approach

4.2.1 General

There is a consensus between CEN and CENELEC experts that the application of the current EN 45545-2:2013+A1:2015 standard applied specifically to Ni-Cd batteries has resulted in an observed risk of battery fire departure initiated by the battery itself.

The use of EN 45545-2:2013+A1:2015 for such areas as vehicle interiors is generally considered clear; Ni-Cd batteries were not considered a problem, and therefore were not specifically addressed.

4.2.2 Need of clarification

In EN 45545-1:2013, listed product and non-listed product are defined respectively in 3.33 and 3.41 referring to EN 45545-2:2013+A1:2015, Table 2. This table does not mention Ni-Cd battery, so Ni-Cd battery is a non-listed product.

NOTE 1 A good definition of listed products could be: "A product which is listed in Table 2 of EN 45545-2:2013+A1:2015, 4.4"