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Road vehicles — Degrees of protection (IP code) — Protection of electrical equipment against foreign objects, water and access

Véhicules routiers — Degrés de protection (codes IP) — Protection des équipements électriques contre les corps étrangers, l'eau et les contacts

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 32, *Electrical and electronic components and general system aspects*.

This third edition cancels and replaces the second edition (ISO 20653:2013), which has been technically revised.

The main changes are as follows:

— test conditions for IPX9K test were extended, the method for measuring of the impact forced was described and tolerances were added, the visualization method for impact force with foam was added;

— details to test setup for degrees of protection against water 3, 4 and 4K were added.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The IP codes used in this document are in accordance with IEC 60529, except in the case of codes “K”, which describe special requirements for road vehicles that are not covered by IEC 60529.

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Road vehicles — Degrees of protection (IP code) — Protection of electrical equipment against foreign objects, water and access

1 Scope

This document applies to degrees of protection (IP code) provided by enclosures of the electrical equipment of road vehicles. It specifies the following:

a) designations and definitions of types and degrees of protection provided by enclosures of electrical equipment (IP codes) for the:

   — protection of electrical equipment within the enclosure against ingress of foreign objects, including dust (protection against foreign objects);

   — protection of persons against access to hazardous parts inside the enclosure (protection against access);

   — protection of electrical equipment inside the enclosure against effects due to ingress of water (protection against water);

b) requirements for each degree of protection;

c) tests carried out in order to confirm that the enclosure complies with requirements of the relevant degree of protection.

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.

ISO 12103-1, *Road vehicles — Test contaminants for filter evaluation — Part 1: Arizona test dust*

IEC 60068-2-68, *Environmental testing — Part 2: Tests — Test L: Dust and sand*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
enclosure
part providing protection of equipment against certain external influences and in any direction against access

3.2
degree of protection
protection provided by an *enclosure* (3.1) against access, foreign objects and/or water and verified by standardized test methods

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