
**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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Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions.....	1
4 Structure and significance of the IP-code.....	2
4.1 Structure of the IP-code	2
4.2 Significance of IP-code	3
4.3 Examples for the use of letters in the IP-Code	4
5 Degrees of protection against foreign objects and against access	4
6 Degrees of protection against water.....	5
7 Designation examples	6
7.1 General.....	6
7.2 Example IP34K	6
7.3 Example IP16KB.....	7
7.4 Example IP2X/IP5KX.....	7
8 Requirements and testing.....	8
8.1 Atmospheric conditions.....	8
8.2 Device under test (DUT)	8
8.3 Requirements and tests for degrees of protection against foreign objects and access	8
8.4 Requirements and test for degrees of protection against water	14
9 Notes on the assignment of degrees of protection.....	14
9.1 Assignment of degrees of protection against foreign objects and access.....	14
9.2 Assignment of degrees of protection against water.....	14
9.3 Determining the impact force distribution of a fan jet nozzle for test 9K.....	18
Bibliography	23

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 20653 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

Introduction

The IP-codes used in this International Standard are in accordance with IEC 60529 except specific codes “K” describing special requirements for road vehicles 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 International Standard 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-Code) for the:
 - protection of electrical equipment within the enclosure against ingress of foreign objects, including dust (protection against foreign objects);
 - protection of electrical equipment inside the enclosure against effects due to ingress of water (protection against water);
 - protection of persons against access to hazardous parts inside the enclosure (protection against access).
- b) Requirements for each degree of protection.
- c) Tests to be carried out in order to confirm that the enclosure complies with requirements of the relevant degree of protection.

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.

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

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

IEC 60529, *Degrees of protection by enclosures (IP-Code)*

3 Terms and definitions

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

3.1

enclosure

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