

This is a preview of "ISO 20653:2013". [Click here to purchase the full version from the ANSI store.](#)

Second edition  
2013-02-15

---

---

## 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*



Reference number  
ISO 20653:2013(E)

© ISO 2013

This is a preview of "ISO 20653:2013". [Click here to purchase the full version from the ANSI store.](#)



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2013

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

This is a preview of "ISO 20653:2013". [Click here to purchase the full version from the ANSI store.](#)

## Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Structure and meaning of the IP code</b> .....	<b>2</b>
4.1 Structure of the IP code.....	2
4.2 Meaning of IP code.....	2
4.3 Examples for the use of letters in the IP code.....	3
<b>5 Degrees of protection against foreign objects and against access</b> .....	<b>4</b>
<b>6 Degrees of protection against water</b> .....	<b>5</b>
<b>7 Designation examples</b> .....	<b>6</b>
7.1 General.....	6
7.2 Example IP34K.....	6
7.3 Example IP16KB.....	6
7.4 Example IP2X/IP5KX.....	7
<b>8 Requirements and testing</b> .....	<b>7</b>
8.1 Atmospheric conditions.....	7
8.2 Device under test (DUT).....	7
8.3 Requirements and tests for degrees of protection against foreign objects and access.....	7
8.4 Requirements and test for degrees of protection against water.....	13
<b>9 Notes on the assignment of degrees of protection</b> .....	<b>14</b>
9.1 Assignment of degrees of protection against foreign objects and access.....	14
9.2 Assignment of degrees of protection against water.....	14
<b>Bibliography</b> .....	<b>23</b>

## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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*.

This second edition cancels and replaces the first edition (ISO 20653:2006), which has been technically revised.

This is a preview of "ISO 20653:2013". [Click here to purchase the full version from the ANSI store.](#)

## **Introduction**

The IP codes used in this International Standard 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.