



# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



HORIZONTAL STANDARD  
NORME HORIZONTALE

**Industrial systems, installations and equipment and industrial products –  
Structuring principles and reference designations –  
Part 2: Classification of objects and codes for classes**

**Systèmes industriels, installations et appareils, et produits industriels –  
Principes de structuration et désignations de référence –  
Partie 2: Classification des objets et codes pour les classes**



This is a preview of "IEC 81346-2:2019". [Click here to purchase the full version from the ANSI store.](#)



### Copyright © 2019 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

#### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

#### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

#### IEC publications search - [webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

#### IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [sales@iec.ch](mailto:sales@iec.ch).

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)

67 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

#### A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

#### A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

#### Recherche de publications IEC - [webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

#### Service Clients - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: [sales@iec.ch](mailto:sales@iec.ch).

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

#### Glossaire IEC - [std.iec.ch/glossary](http://std.iec.ch/glossary)

67 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.



# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



HORIZONTAL STANDARD  
NORME HORIZONTALE

**Industrial systems, installations and equipment and industrial products –  
Structuring principles and reference designations –  
Part 2: Classification of objects and codes for classes**

**Systèmes industriels, installations et appareils, et produits industriels –  
Principes de structuration et désignations de référence –  
Partie 2: Classification des objets et codes pour les classes**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

## CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references .....	6
3 Terms and definitions .....	6
4 Classification principles .....	7
4.1 General.....	7
4.2 Relation between classification and composition.....	8
4.3 Classification schemes of this document.....	8
5 Classification scheme for the inherent function of objects .....	9
5.1 General.....	9
5.2 Entry classes .....	9
5.3 Complete classification scheme .....	10
6 Classification of spaces .....	69
7 Classification of objects applicable for infrastructure .....	79
Annex A (informative) Classification criteria for objects.....	82
A.1 General.....	82
A.2 Structure of classes and subclasses .....	82
A.3 Definition of classes.....	83
Annex B (informative) Object classes related to a generic process .....	84
Annex C (informative) Object classes related to objects in a generic infrastructure .....	85
Annex D (informative) Comparison between Tables 1, 2 and 3 of this document and Tables 1 and 2 of IEC 81346-2:2009.....	87
Annex E (informative) Basic requirements for the development of IEC 81346-2 .....	91
Bibliography.....	92
Figure 1 – Illustration of a classification hierarchy and a composition hierarchy .....	8
Figure A.1 – Illustration of class hierarchy .....	83
Figure B.1 – Object classes related to a generic process .....	84
Figure C.1 – Object classes related to objects in a generic infrastructure.....	86
Table 1 – Entry classes.....	10
Table 2 – First two levels of the classification scheme for inherent function of objects .....	11
Table 3 – Complete classification scheme for inherent function of objects.....	26
Table 4 – Classification scheme for spaces.....	70
Table 5 – Classes of infrastructure objects .....	80
Table 6 – Examples of branch-related classes B to U of Table 5 .....	81
Table D.1 – Comparison between Table 1 of the current edition and Table 1 of IEC 81346-2:2009.....	87
Table D.2 – Comparison between Table 2 and Table 3 of the current edition and Table 2 of IEC 81346-2:2009.....	87

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL SYSTEMS, INSTALLATIONS  
AND EQUIPMENT AND INDUSTRIAL PRODUCTS –  
STRUCTURING PRINCIPLES AND REFERENCE DESIGNATIONS –**

**Part 2: Classification of objects and codes for classes**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 81346-2 has been prepared by IEC technical committee 3: Information structures and elements, identification and marking principles, documentation and graphical symbols, in cooperation with ISO technical committee 10: Technical product documentation.

It is published as a double logo standard.

It has the status of a horizontal standard in accordance with IEC Guide 108.

This second edition cancels and replaces the first edition published in 2009. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

This is a preview of "IEC 81346-2:2019". [Click here to purchase the full version from the ANSI store.](#)

- a) The entry classes of the classification scheme have been defined to reflect the "inherent function" of the object classified;
- b) The classes are defined to align with the principles of ISO 22274 and ISO 704;
- c) A three-level classification scheme has been defined, which provides a greater flexibility for the designer in some technical fields;
- d) Classes are defined by their definition and provided with a preferred term. Examples are provided if needed;
- e) A separate classification scheme for spaces has been provided.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
3/1393/FDIS	3/1402/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 81346 series, published under the general title *Industrial systems, installations and equipment and industrial products – Structuring principles and reference designations*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

## INTRODUCTION

The aim of this document is to establish classification schemes for objects with assigned letter codes for the defined classes, which can be applied throughout all technical areas, e.g. electric, mechanical, process and civil engineering as well as all branches of industry, e.g. energy, chemical, construction, automotive, shipbuilding and marine. The letter codes are intended for use with the rules for the construction of reference designations in accordance with IEC 81346-1 and other parts of the ISO/IEC 81346 series. The letter codes can also be used "stand-alone" as a generic type designation where a type of component is to be indicated, for example in specifications.

The classification scheme in Clause 5 of this document is an enumerative and faceted classification scheme with the inherent function as the entry class. It is made in accordance with the rules in ISO 704 and the guidelines in ISO 22274.

At the entry level, as shown in Table 1, the inherent function is used to narrow down the areas of applicability of the individual classes to a manageable size. For the sub-divisions of the entry classes, faceted approaches are applied to specify the nature of the concepts contained in the leaf classes.

By applying this method, this document provides stable class codes for objects (including systems and system elements), which are independent of how the objects are used or applied in any design during the entire lifecycle.

Any class is defined by its definition only. Users should select the appropriate class for their object to be classified based on the definition, and not rely upon the class name or the examples.

Class code		Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2				
	3				
	<b>BPC</b>	<i>pressure sensing object</i> utilizing two ports for differential pressure sensing, with scalar output	differential pressure transmitter	differential pressure sensor, pressure sensor, relative pressure sensor	
	<b>BPD</b>	<i>pressure sensing object</i> utilizing two ports for differential pressure sensing, with Boolean output	differential pressure switch	pressure sensor, pressure switch, relative pressure detector, relative pressure switch	
	<b>BQ</b>	<i>sensing object</i> for substance concentration	concentration sensing object		Kind of object and kind of output signal
	<b>BQA</b>	<i>concentration sensing object</i> of gas, with scalar output	gas sensor	CO concentration sensor, CO <sub>2</sub> concentration sensor, NH <sub>3</sub> concentration sensor	
	<b>BQB</b>	<i>concentration sensing object</i> of gas, with Boolean output	gas detector	concentration detection switch	
	<b>BQC</b>	<i>concentration sensing object</i> liquid with, scalar output	liquid sensor	concentration sensor, fog sensor, petrol concentration sensor, visibility sensor	
	<b>BQD</b>	<i>concentration sensing object</i> of liquid, with Boolean output	liquid detector	concentration detection switch, fog detector, visibility detector	
	<b>BQE</b>	<i>concentration sensing object</i> of solid matter, with scalar output	solid matter sensor	concentration sensor, smoke sensor, turbidity sensor, visibility sensor	
	<b>BQF</b>	<i>concentration sensing object</i> of solid matter, with Boolean output	solid matter detector	concentration detection switch, smoke detector, smoke switch, turbidity detector, visibility detector	
	<b>BR</b>	<i>sensing object</i> for radiation	radiation sensing object		Kind of radiation and kind of output signal
	<b>BRA</b>	<i>radiation sensing object</i> of visible electromagnetic waves, with scalar output	light sensor		
	<b>BRB</b>	<i>radiation sensing object</i> of visible electromagnetic waves, with Boolean output	light detector	light curtain, light transmitter, line detector, low-light relays, lux sensor, photocell	