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Part 2: Classification of objects and codes for classes

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

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Submission of Comments

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



3/1689/CD

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SECRETARIAT:

Sweden

SECRETARY:

Mr Mikael Törnkvist

OF INTEREST TO THE FOLLOWING COMMITTEES:

TC 8,TC 9,SC 17C,TC 22,SC 22F,SC 22H,TC 31,TC 44,SC 45A,TC 57,TC 64,TC 65,SC 65A,SC 65E,TC 69,TC 82,TC 88,TC 120,SC 121A,SC 121B,TC 122,PC 126,PC 127,SyC SM,SyC Smart Cities,SyC Smart Energy,ISO/IEC JTC 1/SC 25

HORIZONTAL FUNCTION(S):

TC 3 Horizontal

ASPECTS CONCERNED:

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TITLE:

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

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CONTENTS

CONTENTS	1
FOREWORD	4
INTRODUCTION	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	7
4 Classification principles	9
4.1 General	9
4.2 Relation between classification and composition	9
4.3 Classification schemes of this document	10
5 Classification scheme for the inherent function of objects	10
5.1 General	10
5.2 Entry classes	11
5.3 Complete classification scheme	12
6 Classification of spaces	58
6.1 General	58
6.2 Classification of spaces according to their intended activity	59
7 Classification of constructions	69
7.1 General	69
7.2 Classification of construction complexes	69
7.3 Classification of construction entities	70
8 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 IEC 81346-2:2019 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	10
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	11
Table 2 – Complete classification scheme for inherent function of objects	12
Table 3 – Classification scheme for spaces based on intended activity	59
Table 4 – Classes of construction complexes	69

Table 5 – Classes of construction entities	70
Table 6 – Classes of infrastructure objects	80
Table 7 – Examples of branch-related classes B to U of Table 6	81
Table D.1 – Comparison between Table 1 of IEC 81346-2:2019 and Table 1 of IEC 81346-2:2009	87
Table D.2 – Comparison between and Table 2 of IEC 81346-2:2019 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

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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 third edition cancels and replaces the second edition published in 2019. This edition constitutes a technical revision.

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

- a) the existing class definitions have been reviewed and unclearness has been clarified;
- b) the former Table 2 has been removed as its content is included in the new Table 2;
- c) in the new Table 2, new classes are added, class names have been modified and classes considered to be obsolete are marked using a grey scale font;
- d) in the new Table 3, new classes are added, class names have been modified and classes considered to be obsolete are marked using a grey scale font;
- e) more examples are added to a number of classes;
- f) a classification scheme for construction complexes and construction entities have been added as Table 4 and Table 5 respectively, thereby replacing the corresponding tables of ISO 81346-10.

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

FDIS	Report on voting
3/xxx/FDIS	3/xxxx/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.

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

Part 2: Classification of objects and codes for classes

1 Scope

This part of IEC 81346 establishes classification schemes with defined object classes and their associated letter codes. The codes are primarily intended for use in reference designations and for designation of generic types.

The classification schemes are applicable for objects in all technical disciplines and all branches of industry.

This document is a horizontal publication also intended for use by technical committees in preparation of publications related to reference designations in accordance with the principles laid down in IEC Guide 108.

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.

IEC 81346-1:2022, *Industrial systems, installations and equipment and industrial products – Structuring principles and reference designations – Part 1: Basic rules*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 81346-1:2022 and the following 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 <http://www.iso.org/obp>

3.1

inherent function

function of an object, independent of any application of the object

Note 1 to entry: Inherent is regarded as existing in something as a permanent, essential, or characteristic attribute.

3.2

classification scheme

descriptive information for an arrangement or division of objects into groups based on criteria such as characteristics, which the objects have in common

Note 1 to entry: A classification scheme is a concept system used for classifying some objects.

144 [SOURCE: ISO/IEC 11179-3:2023, 3.2.5, modified – Examples have been deleted.]

145 **3.3**

146 **class of object**

147 set of objects characterized by the same inherent function (3.1)

148 **3.4**

149 **space**

150 limited three-dimensional extent defined physically or notionally

151 [SOURCE: ISO 12006-2:2020, 3.1.8]

152 **3.5**

153 **type-of relation**

154 relation between two classes where the characteristics defining one of the classes includes that
155 of the other class and at least one additional delimiting characteristic

156 Note 1 to entry: This term corresponds to the term "generic relation" defined in ISO 12006-2:2020, 3.1.4.

157 **3.6**

158 **activity space**

159 space (3.4) defined by the spatial extension of an activity

160 Note 1 to entry: A spatial extension of an activity, for example, a table or a bed, and the activity space around them.

161 [SOURCE: ISO 12006-2:2020, 3.1.9]

162 **3.7**

163 **construction complex**

164 aggregate of one or more construction entities (3.9) intended to serve at least one function or
165 user activity

166 Note 1 to entry: A construction complex can be analysed and the construction entities that go to make it up, can be
167 identified; e.g. an airport typically is composed of the construction entities runway, control tower, terminal building,
168 aircraft hangar, etc. A business park typically is composed of a number of buildings, access roads and landscaping
169 (each a construction entity in its own right). A motorway from A to B typically is composed of service stations, the
170 motorway pavement, bridges, embankments, landscaping, etc.

171 [SOURCE: ISO 12006-2:2020, 3.4.1]

172 **3.8**

173 **construction entity**

174 independent unit of the built environment with a characteristic form and spatial structure,
175 intended to serve at least one function or user activity

176 Note 1 to entry: A construction entity is the basic unit of the built environment. It is recognizable as a physically
177 independent construction even though a number of construction entities might be seen as parts of a particular
178 construction complex. Ancillary works such as access roads, landscaping, service connections, may be regarded as
179 part of a construction entity. Conversely, when ancillary works are of sufficient scale they may be regarded as
180 construction entities in their own right.

181 [SOURCE: ISO 12006-2:2020, 3.4.2]

182 **3.9**

183 **infrastructure**

184 system of facilities, equipment and services needed for the operation of society or an
185 organization

[SOURCE: ISO 9000:2015, 3.5.2, modified – "an organization" replaced by "society or an organization".]

4 Classification principles

4.1 General

The purpose of classifying is to distinguish among objects in a collection based on differentiation of characteristics of interest. Classes are organized in type-of relations and are defined by different values of a specific characteristic of interest.

The classification in this document is made with an entry class based on function in a broad sense. This is in accordance with ISO 22274:2013, 5.4.4 which recommends a combination of an enumerative and faceted classification system with an entry class.

When a class code is applied in a reference designation, the purpose is to classify the occurrence of the object, not the individual, as described in IEC 81346-1:2022, 4.9 and Table 1. In such a situation, the object is generally specified and assigned its inherent function in the design stage of the project. Classes can also be used by manufacturers to show multiple potential use of a product. In this way, the classification can enhance searchability.

The class name (preferred term) assigned to the classes and the examples of terms provided in this document are based on the inherent function of an object, i.e. independent of any application.

This classification scheme ensures a life cycle stable class code, as the object occurrence is classified by its stable inherent function; a stake is a stake, a door is a door and so on, no matter what individual is used to realize the occurrence.

Objects related to a class can be considered as a discrete collection of objects and can therefore be further classified into sub-classes based on the differentiation of a specific characteristic. In this document, this has resulted in a classification scheme starting with classes representing general types based on function in a broad sense (1st letter code), continuing into classes representing types that are more specialized in two steps, represented by 2nd and 3rd letter in the class code.

All examples and terms in the classification scheme of this document are recognized as being used to name a member of their class. As different branches have different usage of terminology, the same example or term might occur in different classes.

4.2 Relation between classification and composition

IEC 81346-1 defines rules on how a complex object can be structured into its constituent objects resulting in a composition hierarchy. For the purpose of classifying objects, this document defines classes and codes that results in a classification hierarchy, see Figure 1, which is a copy of Figure 2 in 4.2 of ISO 12006-2:2015.

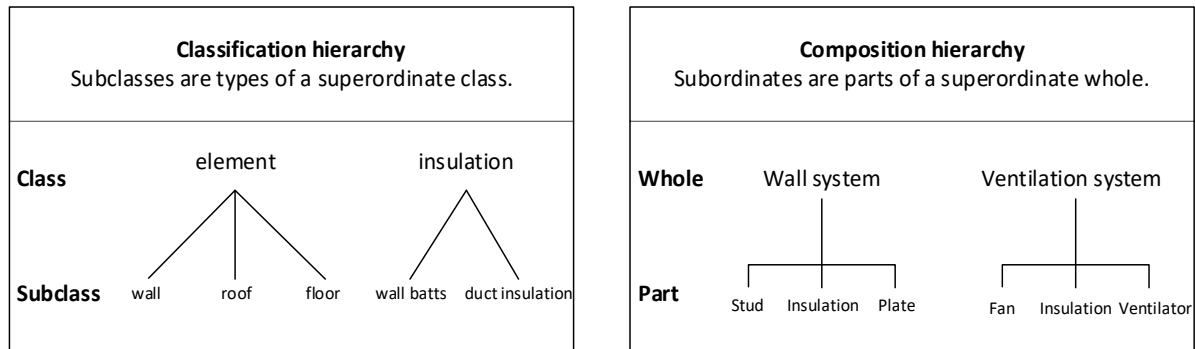


Figure 1 – Illustration of a classification hierarchy and a composition hierarchy

4.3 Classification schemes of this document

This document provides different classification schemes of objects primarily intended for use in reference designations, based on the basic requirements given in Annex E. The provided classification schemes are:

- inherent function of objects, see 5;
- spaces, see 6;
- construction complexes, see 7.2;
- construction entities, see 7.3;
- infrastructure objects, see 8.

The content of any class is determined by the definition of the class only. A preferred term determines the class in daily use and forms part of the definition of subclasses. The classification tables of this document are considered to be complete, and therefore no “miscellaneous” or “other” classes are present. If no appropriate class for an object-of-interest can be found as a sub-class or sub-sub-class, objects shall be classified to the higher class level i.e. to the sub-class or entry class.

This document provides classification schemes with multiple classification levels. The user can choose to apply letter codes using

- a single letter, representing the entry class; or
- two letter code, representing a sub-class in the scheme; or
- three letter code, representing a sub-sub-class in the scheme.

5 Classification scheme for the inherent function of objects

5.1 General

The classification scheme defined in this clause is based on the inherent function of objects.

The classification scheme has a hierarchical classification structure that constitute three levels from top to lower.

The entry classes and their respective subclasses are defined considering the inherent function of objects, based on the knowledge of the use of objects in existing designs, and the classification schemes defined in IEC 81346-2:2009, and are updated in relation to the schemes defined in IEC 81346-2:2019.

NOTE 1 When the classification scheme shown in Table 1 and Table 2 refer to high-voltage or low-voltage, high-voltage is considered to be any voltage > 1 000 V AC or > 1 500 V DC. Low-voltage is considered to be any voltage ≤ 1 000 V AC or ≤ 1 500 V DC. These voltage limits are in accordance with IEC 61140.

NOTE 2 In Annex D, the difference between the classification scheme and classes in IEC 81346-2:2009 and the classification scheme and classes of this publication is given.

5.2 Entry classes

Table 1 defines the entry classes for the classification scheme for inherent function of objects.

Table 1 – Entry classes for inherent function

Class code	Class definition	Class name
B	object for picking up information and providing a representation	sensing object
C	object for storing for subsequent retrieval	storing object
E	object for emitting	emitting object
F	object for protecting against the effects of dangerous or undesirable conditions	protecting object
G	object for providing a controllable flow	generating object
H	object for treating matter	matter processing object
K	object for treating input signals and providing an appropriate output	information processing object
M	object for providing mechanical movement or force	driving object
N	object for enclosing partly or fully another object	covering object
P	object for providing perceptible information	presenting object
Q	object for controlling access or flow	controlling object
R	object for restricting or stabilising	restricting object
S	object for detecting a human action and providing an appropriate response	human interaction object
T	object for transforming	transforming object
U	object for localising of other objects	holding object
W	object for leading from one place to another	guiding object
X	object for interfacing an object	interfacing object
The letters A, I and O shall not be used as a class code.		
The letters D, J, L, V, Y and Z are reserved for future standardization.		

Each class defined in Table 1 is in this document associated with a set of predefined subclasses allowing a more detailed characterization of an object, if required. The definitions of subclasses of objects (sub-class and sub-sub-class) are presented in Table 2 together with their associated letter codes.

NOTE Subclasses do not define a new level in a composition structure, i.e. they do not describe a subdivision of the object. Class and subclass refer to the same object.

Annex B illustrates how the classes in Table 1 relate to a generic process.

5.3 Complete classification scheme

Table 2 shows the classification scheme for inherent function of objects.

Numerals below class code in the table header in Table 2 show the level in the classification structure, that is, level 1, 2 and 3 mean entry class, sub-class and sub-sub-class respectively, see Annex A.

In Table 2, classes that are considered to be obsolete, i.e. classes that no longer should be uses, are indicated using a grey scale font.

Table 2 – Complete classification scheme for inherent function of objects

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
B			<i>object</i> for picking up information and providing a representation	sensing object		Kind of quantity
	BA		<i>sensing object</i> for electric potential	electric potential sensing object		Kind of output signal
		BAA	<i>electric potential sensing object</i> , with scalar output	voltage transformer	coupling capacitor, measuring voltage transformer	
		BAB	<i>electric potential sensing object</i> , with Boolean output	voltage relay	measuring voltage relay	
	BB		<i>sensing object</i> for resistivity or conductivity	resistivity sensing object		Kind of flow and output signal
		BBA	<i>resistivity sensing object for electric current flow</i> , with scalar output	electric resistivity sensor		
		BBB	<i>resistivity sensing object for electric current flow</i> , with Boolean output	electric resistivity detector		
		BBC	<i>resistivity sensing object for thermal flow</i> , with scalar output	thermal resistivity sensor		
		BBD	<i>resistivity sensing object for thermal flow</i> , with Boolean output	thermal resistivity detector		
	BC		<i>sensing object</i> for electric current	electric current sensing object		Kind of output signal
		BCA	<i>electric current sensing object</i> , with scalar output	current transformer	measuring current transformer	
		BCB	<i>electric current sensing object</i> , with Boolean output	current relay	electronic overload relay, measuring current relay, overload relay	
	BD		<i>sensing object</i> for density	density sensing object		Kind of output signal
		BDA	<i>density sensing object</i> , with scalar output	density transmitter	aerometer, density sensor, hydrometer	
		BDB	<i>density sensing object</i> , with Boolean output	density switch	density sensor	
	BE		<i>sensing object</i> for field	field sensing object		Kind of output signal

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
		BEA	<i>field sensing object</i> for electric field, with scalar output	electric field sensor		
		BEB	<i>field sensing object</i> for electric field, with Boolean output	electric field detector		
		BEC	<i>field sensing object</i> for magnetic field, with scalar output	magnetic field sensor		
		BED	<i>field sensing object</i> for magnetic field, with Boolean output	magnetic field detector	reed relay, reed switch	
	BF		sensing object for flow	flow sensing object		Kind of output signal
		BFA	<i>flow sensing object</i> , with scalar output	flow transmitter	flow sensor, gas flow sensor, liquid flow sensor, matter flow sensor, water flow sensor	
		BFB	<i>flow sensing object</i> , with Boolean output	flow switch	gas flow switch, matter flow switch	
	BG		<i>sensing object</i> of spatial dimension or position	physical dimension sensing object		Kind being sensed and kind of output signal
		BGA	<i>physical dimension sensing object</i> of position, with scalar output	position transmitter	position sensor, presence locator, radar	
		BGB	<i>physical dimension sensing object</i> of position, with Boolean output	position switch	movement detector, movement sensor (PIR), position sensor, presence indicator	
		BGC	<i>physical dimension sensing object</i> of length, with scalar output	distance transmitter	laser distance sensor, position sensor, visibility sensor	
		BGD	<i>physical dimension sensing object</i> of length, with Boolean output	distance switch	laser distance sensor, laser distance sensing switch, movement detector, movement sensor (PIR), position sensor, presence indicator, visibility detector	
		BGE	<i>physical dimension sensing object</i> of angle or direction, with scalar output	angle transmitter	alignment sensor, end stop, position sensor, position transmitter, rotary encoder, wind direction indicator	
		BGF	<i>physical dimension sensing object</i> of angle or direction, with Boolean output	angle switch	alignment threshold detector, movement detector, movement sensor (PIR), position sensor, presence indicator, radar	
		BGG	<i>physical dimension sensing object</i> of physical object	object scanner	2D-scanner, 3D-scanner, coordinates scanner, laser scanner	
	BH		<i>sensing object</i> for energy	energy sensing object		Kind of energy

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
		BHA	<i>energy sensing object</i> of flow with defined energy density	flow energy meter	energy cooling meter, energy meter, energy sensor, gas energy meter	
		BHB	<i>energy sensing object</i> of thermal flow with defined heat capacity	thermal energy meter	condensate sensor, energy cooling meter, energy meter, energy sensor	
		BHC	<i>energy sensing object</i> of electricity flow	electric energy meter	kWh sensor	
	BJ		<i>sensing object</i> for power	power sensing object		Kind of output signal
		BJA	<i>power sensing object</i> , with scalar output	power meter	kW meter	
		BJB	<i>power sensing object</i> , with Boolean output	power limit switch		
	BK		<i>sensing object</i> for time	time sensing object		Kind of output signal
		BKA	<i>time sensing object</i> , with scalar output	time sensor	clock, time information device	
		BKB	<i>time sensing object</i> , with Boolean output	timer switch	time counter	
	BL		<i>sensing object</i> for level	level sensing object		Kind of output signal
		BLA	<i>level sensing object</i> , with scalar output	level transmitter	level sensor, liquid level sensor	
		BLB	<i>level sensing object</i> , with Boolean output	level switch	liquid level switch	
	BM		<i>sensing object</i> for humidity	humidity sensing object		Kind of output signal
		BMA	<i>humidity sensing object</i> with scalar output	humidity transmitter	humidity sensor	
		BMB	<i>humidity sensing object</i> , with Boolean output	humidity switch	humidity sensor	
	BP		<i>sensing object</i> for pressure	pressure sensing object		Kind of output signal
		BPA	<i>pressure sensing object</i> for absolute pressure sensing, with scalar output	absolute pressure transmitter	absolute pressure sensor, manometer, pressure monitor, pressure sensor, pressure transducer	
		BPB	<i>pressure sensing object</i> for absolute pressure sensing, with Boolean output	absolute pressure switch	pressure switch	
		BPC	<i>pressure sensing object</i> for differential pressure sensing, with scalar output	differential pressure transmitter	differential pressure sensor, pressure sensor	
		BPD	<i>pressure sensing object</i> for differential pressure sensing, with Boolean output	differential pressure switch	pressure sensor, pressure switch	
		BPE	<i>pressure sensing object</i> for relative pressure sensing, with scalar output	relative pressure transmitter	relative pressure sensor	

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
		BPF	<i>pressure sensing object</i> for relative pressure sensing, with Boolean output	relative pressure switch	relative pressure detector	
		BQ	<i>sensing object</i> for substance concentration	concentration sensing object		Kind of object and kind of output signal
		BQA	<i>concentration sensing object</i> of gas, with scalar output	gas sensor	CO concentration sensor, CO ₂ concentration sensor, concentration sensor, NH ₃ concentration sensor	
		BQB	<i>concentration sensing object</i> of gas, with Boolean output	gas detector	concentration detection switch	
		BQC	<i>concentration sensing object</i> liquid with, scalar output	liquid sensor	concentration sensor, fog sensor, petrol concentration sensor, visibility sensor	
		BQD	<i>concentration sensing object</i> of liquid, with Boolean output	liquid detector	concentration detection switch, fog detector, visibility detector	
		BQE	<i>concentration sensing object</i> of solid matter, with scalar output	solid matter sensor	concentration sensor, smoke sensor, turbidity sensor, visibility sensor	
		BQF	<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	
		BR	<i>sensing object</i> for radiation	radiation sensing object		Kind of radiation and kind of output signal
		BRA	<i>radiation sensing object</i> of visible electromagnetic waves, with scalar output	light sensor		
		BRB	<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	
		BRC	<i>radiation sensing object</i> for non-visible electromagnetic waves, with scalar output	electromagnetic wave sensor	gamma-radiation detector, IR-sensor, radar-sensor, UV-sensor	
		BRD	<i>radiation sensing object</i> for non-visible electromagnetic waves, with Boolean output	electromagnetic wave detector		
		BRE	<i>radiation sensing object</i> of nuclear particles, with scalar output	radiation counter	alpha-particle sensor (helium nucleus), beta-particle sensor (electron nucleus), Geiger meter, neutron-particle sensor	
		BRF	<i>radiation sensing object</i> of nuclear particles, with Boolean output	radiation detector		

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
	BS		<i>sensing object</i> for time-rate	time-rating object		Kind of time object sensed and kind of output signal
		BSA	<i>time-rating object</i> of non-rotational cycles, with scalar output	cycle rate transmitter	cycle rate sensor, frequency transmitter	
		BSB	<i>time-rating object</i> of non-rotational cycles, with Boolean output	cycle rate detecting switch		
		BSC	<i>time-rating object</i> of distance, with scalar output	speed sensing transmitter	movement transmitter, speed sensor	
		BSD	<i>time-rating object</i> of distance, with Boolean output	speed detecting switch	movement detector	
		BSE	<i>time-rating object</i> of rotation, with scalar output	tachometer	rotation speed sensor	
		BSF	<i>time-rating object</i> of rotation, with Boolean output	rotation speed relay		
		BSG	<i>time-rating object</i> of speed, with scalar output	accelerometer transmitter	seismic sensor	
		BSH	<i>time-rating object</i> of speed, with Boolean output	accelerometer relay	seismic switch, shake switch	
	BT		<i>sensing object</i> for temperature	temperature sensing object		Kind of output signal
		BTA	<i>temperature sensing object</i> , with scalar output	temperature transmitter	temperature sensor	
		BTB	<i>temperature sensing object</i> , with Boolean output	temperature switch	fire thermostat, temperature detector	
	BU		<i>sensing object</i> for multiple quantities	multi-quantity sensing object		Kind of output signal
		BUA	<i>multi-quantity sensing object</i> , with scalar output(s)	multi-sensor	dew point sensor, multimeter	
		BUB	<i>multi-quantity sensing object</i> , with Boolean output(s)	multi-detector	Buchholz relay, differential relay, distance protection relay, impedance protection relay, negative phase-sequence relay	
	BW		<i>sensing object</i> for weight, force or torque	force sensing object		Kind of object sensed and kind of output signal
		BWA	<i>force sensing object</i> of weight, with scalar output	weight transmitter	load cell, weight sensor	
		BWB	<i>force sensing object</i> of weight, with Boolean output	weight detecting switch		
		BWC	<i>force sensing object</i> of force, with scalar output	force value transmitter	force sensor	
		BWD	<i>force sensing object</i> of force, with Boolean output	force detecting switch	force sensor	

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
		BWE	<i>force sensing object</i> of torque, with scalar output	torque value transmitter	torque sensor	
		BWF	<i>force sensing object</i> of torque, with Boolean output	torque switch	torque sensor	
	BX		<i>sensing object</i> of sound or visual appearance	audio-visual sensing object		Kind of output signal
		BXA	<i>audio-visual sensing object</i> of sound, with scalar output	acoustic sensor	acoustic survey device, microphone	
		BXB	<i>audio-visual sensing object</i> of sound, with Boolean output	acoustic detector	glass breakage detector	
		BXC	<i>audio-visual sensing object</i> of visual appearance, with scalar output	image sensor	camera, CCTV, PTZ camera, scanner	
		BXD	<i>audio-visual sensing object</i> of visual appearance, with Boolean output	image detector	face recognition device, finger-print reader, iris reader	
		BXE	<i>audio-visual sensing object of sound and visual appearance, with scalar output</i>	video camera		
	BY		<i>sensing object</i> of stored information	information sensing object		Kind of method
		BYA	<i>Information sensing object</i> by electrical connection	chip reader	chip card reader	
		BYB	<i>Information sensing object</i> by electromagnetic field	electromagnetic reader	magnetic stripe reader, RFC reader, RFID reader, tape reader	
		BYC	<i>Information sensing object</i> by light	optical reader	barcode reader, optical disk reader, QR-reader	
	BZ		<i>sensing object</i> for incidents or amounts	incident sensing object		Kind of incidents or amounts sensed
		BZA	<i>incident sensing object</i> detecting the number of incidents, with scalar output	counter		
		BZB	<i>incident sensing object</i> detecting an incident, with Boolean output	threshold detector		
		BZC	<i>incident sensing object</i> detecting the presence of humans, with Boolean output	person detector	presence detector	
		BZD	<i>incident sensing object</i> detecting the presence of matters, with Boolean output	matter detector		
C			<i>object</i> for storing for subsequent retrieval	storing object		Kind of object being stored, and the method applied

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
	CA		<i>storing object</i> for electric energy within an electrostatic field	capacitive storing object		Kind of method applied
		CAA	<i>capacitive storing object</i> for electric charge	capacitor		
	CB		<i>storing object</i> for electric energy within an electromagnetic field	inductive storing object		Kind of method applied
		CBA	<i>inductive storing object</i> for inductive charge	inductor		
	CC		<i>storing object</i> for electric energy within an electrochemical substance	electrochemical storing object		Kind of method applied
		CCA	<i>electrochemical storing object</i> by reversible reactions	rechargeable battery		
	CF		<i>storing object</i> for information	information storing object		Kind of method applied
		CFA	<i>information storing object</i> on a carrier medium	information storing media		
	CL		<i>storing object</i> for matters or persons within a stationary open enclosure	open stationary storing object		Kind of method applied
		CLA	<i>open stationary storing object</i> for fluids	pool	bunker, cistern, pit	
		CLB	<i>open stationary storing object</i> for solid objects	shelf		
		CLC	<i>Open stationary storing object</i> for persons	seat	bed, chair, couch	
	CM		<i>storing object</i> for matters within a stationary closed enclosure	enclosed stationary storing object		Kind of matters stored
		CMA	<i>enclosed stationary storing object</i> for fluids	stationary tank		
		CMB	<i>enclosed stationary storing object</i> for solid matters	silo	cabinet, cupboard	
	CN		<i>storing object</i> for matters or persons within a moveable closed enclosure	moveable storing object		Kind of matters stored
		CNA	<i>moveable storing object</i> for solid matters or persons	container	bucket, elevator bucket, excavator bucket, lift car	
		CNB	<i>moveable storing object</i> for gas	gas cylinder		
		CNC	<i>moveable storing object</i> for liquid	drum		
		CND	<i>moveable storing object</i> for unpressurized fluids	moveable tank	drum	
		CNE	<i>moveable storing object</i> for pressurized fluids	moveable pressurized tank	gas cylinder	
	CP		<i>storing object</i> of thermal energy	thermal energy storing object		Kind of thermal energy

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
		CPA	<i>thermal energy storing object of liquid</i>	liquid tank	calorifier	
		CPB	<i>thermal energy storing object of gas</i>	gas tank		
		CPC	<i>thermal energy storing object of solid matter</i>	thermal matter tank		
		CPD	<i>thermal energy storing object of state changing material</i>	crystalline tank		
		CPE	<i>thermal energy storing object of unpressurized fluids</i>	thermal fluids tanks	hot water tank	
		CPF	<i>thermal energy storing object of pressurized fluids</i>	thermal pressurized fluids tanks		
	CQ		<i>storing object of mechanical energy</i>	mechanical energy storing object		Kind of mechanical energy
		CQA	<i>mechanical energy storing object in the form of kinetic energy</i>	flywheel		
		CQB	<i>mechanical energy storing object in the form of elastic energy</i>	spring	rubber band	
		CQC	<i>mechanical energy storing object in the form of gravitational energy</i>	counterweight	elevated mass	
E			<i>object for emitting</i>	emitting object		Kind of object being emitted and kind of energy source
	EA		<i>emitting object of light</i>	light emitting object		Kind of energy source
		EAA	<i>light emitting object utilizing electricity</i>	electric lamp	argon lamp, electro luminescent devices, fluorescent lamp, fluorescent tube, lamp, lamp bulb, laser, neon lamp	
		EAB	<i>light emitting object utilizing gas combustion</i>	gas lamp		
		EAC	<i>light emitting object utilizing liquid combustion</i>	liquid lamp	paraffin lamp	
	EB		<i>emitting object of heat provided by electric energy</i>	electric heating object	electric heater	Kind of delivery method
		EBA	<i>electric heating object delivered by fluid</i>	electric boiler		
		EBB	<i>electric heating object delivered by a surface</i>	electric heating surface	frying plate, heat mat, sauna	
		EBC	<i>electric heating object delivered by a cable</i>	heating cable		
		EBD	<i>electric heating object delivered by forced air</i>	electric hot air blower		
		EBE	<i>electric heating object delivered by an electric arc</i>	arc heating object	electric arc furnace	

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
		EBF	<i>electric heating object</i> delivered by a current flow	induction heater	induction oven	
		EBG	<i>electric heating object</i> delivered by infrared radiation	infrared heater		
		EBH	<i>electric heating object</i> delivered by surrounding surfaces	electric oven		
	EC		<i>emitting object</i> of coldness provided by electric energy	electric cooling object		Kind of method
		ECA	<i>electric cooling object</i> applying a cooling surface	electric cooling surface		
		ECB	<i>electric cooling object</i> applying forced air	electric cold air blower	air cooler	
		ECC	<i>electric cooling object</i> utilizing phase changing	compression chiller		
	EE		<i>emitting object</i> of wireless power	wireless power object		Kind of method
		EEA	wireless power object utilizing inductive coupling	inductive power antenna		
		EEB	wireless power object utilizing microwaves	magnetron	maser, microwave oven	
		EEC	wireless power object utilizing x-rays	X-ray source		
		EED	wireless power object utilizing gamma rays	gamma ray source		
		EEE	wireless power object utilizing capacitive coupling	capacitive coupler		
	EG		<i>emitting object</i> of heat and coldness provided by transfer of thermal energy	thermal energy transfer object		Kind of method
		EGA	<i>thermal energy transfer object</i> utilizing phase changing	heat pump	absorption chiller, adsorption chiller, cooling machine, freezer, fridge, reefer, refrigerated container, refrigerator, reversible heat pump	
		EGB	<i>thermal energy transfer object</i> utilizing Peltier effect	Peltier element		
		EGC	<i>thermal energy transfer object</i> between flows by means of an intermediate material	heat exchanger	plate heat exchanger, spiral heat exchanger, tubular heat exchanger	
	EM		<i>emitting object</i> of heat provided by combustion	combustion heating object		Kind of object heated
		EMA	<i>combustion heating object</i> for heating of space	stove	flare	
		EMB	<i>combustion heating object</i> for heating of fluid	combustion boiler	steam generator	
		EMC	<i>combustion heating object</i> for heating of solid matter	burner		

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
	EP		<i>emitting object</i> providing heating by thermal energy	thermal heating object		Kind of method
		EPA	<i>thermal heating object</i> delivered by a permeable heated surface	heating surface		
		EPB	<i>thermal heating object</i> delivered by heated fluid	heating tube	heating coil, heating pipe	
		EPC	<i>thermal heating object</i> delivered by a non-permeable heated surface	heating panel	condenser, radiator	
		EPD	<i>thermal heating object</i> delivered by forced air	hot air blower		
	EQ		<i>emitting object</i> providing cooling by thermal energy	thermal cooling object		Kind of method
		EQA	<i>thermal cooling object</i> delivered by a permeable cold surface	cooling surface		
		EQB	<i>thermal cooling object</i> delivered by a non-permeable cold surface	cooling panel	cooling tower, evaporator	
		EQC	<i>thermal cooling object</i> delivered by forced air	cold air blower		
		EQD	<i>thermal cooling object</i> delivered by cold fluid	cooler	cooling coil, cooling pipe, cooling tube, spray cooler	
		EQE	<i>thermal cooling object</i> applying chilled liquid in tubes	cooling tube	cooling coil, cooling pipe	
	ET		<i>emitting object</i> of heat provided by nuclear fission	nuclear powered heating object		Kind of output
		ETA	<i>nuclear powered heating object</i> providing hot water	boiling water reactor		
		ETB	<i>nuclear powered heating object</i> providing steam fluid	pressurized water reactor		
		ETC	<i>nuclear powered heating object</i> providing hot gas	high-temperature gas-cooled reactor	pebble bed reactor	
	EU		<i>emitting object</i> of sub-atomic particles	particle emitting object		Kind of method
		EUA	<i>particle emitting object</i> being ionized	plasma generator		
		EUB	<i>particle emitting object</i> being non-ionized	particle generator	alpha-ray device, beta-ray device, neutron-ray device	
	EV		<i>emitting object</i> of acoustic waves	acoustic wave emitting object		Kind of method
		EVA	<i>acoustic wave emitting object</i> utilizing ultrasonic frequencies	acoustic wave transmitter		
		EVB	<i>acoustic wave emitting object</i> utilizing audible frequencies for noise cancellation	anti-noise loudspeaker		

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
F			<i>object</i> for protecting against the effects of dangerous or undesirable conditions	protecting object		Kind of source or kind of effect
	FA		<i>protecting object</i> related to overvoltages	overvoltage protecting object		Kind of method applied
		FAA	<i>overvoltage protecting object</i> by a spark gap	spark gap surge arrester	limiter	
		FAB	<i>overvoltage protecting object</i> by a varistor	varistor surge arrester	limiter	
		FAC	<i>overvoltage protecting object</i> by a zener diode	zener diode	limiter	
		FAD	<i>overvoltage protecting object</i> by surge absorption	surge absorber		
	FB		<i>protecting object</i> related to earth fault currents	earth fault current protecting object		Kind of method applied
		FBA	<i>earth fault current protecting object</i> that monitors an electric network and switches off in the event of earth fault currents	residual current device	appliance leakage current interrupter (ALCI), earth fault leakage breaker, earth-leakage circuit-breaker (ELCB), ground fault circuit interrupter (GFCI), ground fault interrupter (GFI), residual current circuit breaker (RCCB)	
		FBB	<i>earth fault current protecting object</i> that limits the value of an earth fault current	neutral earthing limiter	neutral earthing reactor, neutral earthing impedance, Petersen coil	
	FC		<i>protecting object</i> related to overcurrents	overcurrent protecting object		Kind of method applied
		FCA	<i>overcurrent protecting object</i> that by fusing opens the circuit in which it is inserted by breaking the current when this exceeds a given value for a sufficient time	fuse		
		FCB	<i>overcurrent protecting object</i> capable of making, carrying and breaking currents under normal circuit conditions and also making, carrying for a specified time, and automatically breaking currents under specified abnormal circuit conditions NOTE This class is intended for circuit-breakers such as those defined in accordance with IEC 60898 series.	miniature circuit-breaker	motor-protection device	

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
		FCC	<i>overcurrent protecting object</i> that opens the circuit in which it is inserted by interrupting the current when this exceeds a given value for a sufficient time	bimetal	bimetal circuit-breaker, overload thermal release, thermal overload relay	
		FE	<i>protecting object</i> related to electric or magnetic fields	field protecting object		Kind of method applied
		FEA	<i>field protecting object</i> of electric fields	electric field shield	Faraday cage	
		FEB	<i>field protecting object</i> of magnetic fields	magnetic field shield	Mu-metal shielding (against static or low-frequency magnetic fields)	
		FEC	<i>field protecting object</i> of electromagnetic fields	electromagnetic field shield	concrete wall, Faraday cage, lead block, metal sheets	
		FL	<i>protecting object</i> related to pressure	pressure protecting object		Kind of pressure
		FLA	<i>pressure protecting object</i> releasing steam or liquid when the pressure exceeds a set limit value	safety valve		
		FLB	<i>pressure protecting object</i> opening or closing an air flow when the pressure is above or below a set limit value	safety damper		
		FLC	<i>pressure protecting object</i> preventing vacuum	vacuum breaker		
		FLD	<i>pressure protecting object</i> that breaks open irreversibly in the event of excessive pressure difference	rupture disc		
		FLE	<i>pressure protecting object</i> provided by a volume expansion	expansion tank	expansion vessel	
		FM	<i>protecting object</i> related to fire	fire protecting object		Kind of method applied and possible cause for activation
		FMA	<i>fire protecting object</i> closing a gaseous flow on detection of smoke or fire	fire damper		
		FMB	<i>fire protecting object</i> opening or closing a gaseous flow on detection of smoke or fire	flue damper		
		FMC	<i>fire protecting object</i> closing a gaseous flow on detection of smoke or fire	fire-and-flue damper		
		FMD	<i>fire protecting object</i> for manual operation	fire extinguisher	fire blanket	

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
		FME	<i>fire protecting object</i> closing a passage for preventing spread of smoke or fire	fire blind		
		FMF	<i>fire protecting object</i> dividing an area into smoke zones	smoke curtain		
		FMG	<i>fire protecting object</i> closing a hole for preventing spread of fire	smoke closure		
		FMH	<i>fire protecting object</i> by a surface cover	fire insulation		
		FMJ	<i>fire protecting object</i> by a surface coating	fire retardant coating	fire protecting coating	
		FMK	<i>fire protecting object</i> by impregnation	fire impregnation		
	FN		<i>protecting object</i> related to mechanical force	mechanical force protecting object		Kind of method applied
		FNA	<i>mechanical force protecting object</i> providing a disconnection when a torque becomes too high	safety clutch		
		FNB	<i>mechanical force protecting object</i> absorbing impact	impact protection	airbag, arrestor bed, cable protection, cushion, rubber padding	
	FQ		<i>protecting object</i> by barrier or obstacle	preventive protecting object		Kind of purpose of the prevention
		FQA	<i>preventive protecting object</i> against objects passing	protective barrier	protective cover, protective film, protective grid, protective lid, protective mesh	
		FQB	<i>preventive protecting object</i> against objects or matter sliding or drifting	glide protection	snow guard	
		FQC	<i>preventive protecting object</i> against falling	protective rod	handrail, suspension guard	
		FQD	<i>preventive protecting object</i> against falling out or colliding	protective rail	guard rail, protective roof	
		FQE	<i>preventive protecting object</i> against physical penetration	protective fabric	protective film,	
		FQF	<i>preventive protecting object</i> against glare	glare protection		
		FQG	<i>preventive protecting object</i> against splatter	splatter protection		
		FQH	<i>preventive protecting object</i> against manual breakage	break protection		
		FQJ	<i>preventive protecting object</i> against manual unlocking	lock hatch cover		
	FR		<i>protecting object</i> related to material erosion	wear protecting object		Kind of method applied

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
		FRA	<i>wear protecting object</i> providing liquid material between objects	lubrication object	lubricating oil	
		FRB	<i>wear protecting object</i> providing a solid separating material between objects	wear pad		
		FRC	<i>wear protecting object</i> in providing a removable layer on the surface on another object	glacis		
	FS		<i>protecting object</i> related to the local environment	environment protecting object		Kind of method applied
		FSA	<i>environment protecting object</i> in the form of a solidified paste layer covering another object	plaster	cement, mortar	
		FSB	<i>environment protecting object</i> in the form of a hardened liquid film on the surface of another object	paint		
		FSC	<i>environment protecting object</i> in the form of an applied or induced liquid making the object resistant to externally induced decay or destruction	impregnation	impregnation sheet	
		FSD	<i>environment protecting object</i> providing shelter against climatic effects	shelter	avalanche shed, house, shed, snow guard	
		FSE	<i>environment protecting object</i> in the form of vibration control	seismic vibration control device		
		FSF	<i>environment protection object</i> in the form of oxidation of metal	corrosion protection	cathodic protection, sacrificial anode	
		FSG	<i>environment protecting object</i> in the form of a seal on the surface of another object	protective seal	protective film,	
		FSH	<i>environment protecting object</i> in the form of a capillary action breaking layer	material separating layer		
	FT		<i>protecting object for persons or animals against bodily harm</i>	body protection object		Kind of object to be protected
		FTA	<i>body protection object</i> related to sight	protection glasses	visor	
		FTB	<i>body protection object</i> related to hearing	earplugs	ear cap, ear muff	
		FTC	<i>body protection object</i> related to the head	helmet	headgear	
		FTD	<i>body protection object</i> related to respiration	gasmask		
		FTE	<i>body protection object</i> related to the feet	shoes	boots	

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
		FTF	<i>body protection object</i> related to the hands	gloves		
		FTG	<i>body protection object</i> related to the lower body	pants	trousers	
		FTH	<i>body protection object</i> related to the upper body	jacket		
		FTJ	<i>body protection object</i> related to the full body	protection suit	overalls	
G			<i>object</i> for providing a controllable flow	generating object		Kind of object flowing and kind of source
	GA		<i>generating object</i> of electric energy powered by mechanical energy	mechanical to electrical energy generating object		Kind of voltage and current form
		GAA	<i>mechanical to electrical energy generating object</i> of alternating current	AC generator	generator	
		GAB	<i>mechanical to electrical energy generating object</i> of direct current	DC generator	dynamo, generator	
	GB		<i>generating object</i> of electric energy powered by chemical reaction	chemical to electrical energy generating object		Kind of source method applied
		GBA	<i>chemical to electrical energy generating object</i> from a non-renewable source	electric battery	battery	
		GBB	<i>chemical to electrical energy generating object</i> continuously fed by fuel and oxidant	fuel cell		
	GC		<i>generating object</i> of electric energy from solar energy	solar to electrical energy generating object		Kind of method applied
		GCA	<i>solar to electrical energy generating object</i> utilizing wafer based semiconducting material	crystalline photovoltaic module	solar cell	
		GCB	<i>solar to electrical energy generating object</i> utilizing thin film material	thin film photovoltaic module	solar cell	
	GF		<i>generating object</i> of signals for carrier of information	signal generating object		Kind of source distribution method
		GFA	<i>signal generating object</i> by electromagnetic waves	electromagnetic wave transmitter	laser transmitter, radio- wave transmitter, television station	
		GFB	<i>signal generating object</i> by wires	signal generator		
	GL		<i>generating object</i> continuously of solid matter	continuous transport object		Direction and size of matters
		GLA	<i>continuous transport object</i> on a belt	belt conveyer	conveyer belt	
		GLB	<i>continuous transport object</i> on a chain	chain conveyer		
		GLC	<i>continuous transport object</i> on rollers	roller conveyer		

Class code			Class definition	Class name (preferred term)	Examples of terms	Criteria for definition of subclasses
1	2	3				
		GLD	<i>continuous transport object</i> propelled by a screw	screw conveyer	lift screw, snow blower, snow thrower	
		GLE	<i>continuous transport object</i> consisting of a chain of steps	escalator		
		GLF	<i>continuous transport object</i> consisting of chain of containers	paternoster		
		GLG	<i>continuous transport object</i> on a vibrating surface	vibrating conveyor		
	GM		<i>generating object</i> discontinuously of solid matter	discontinuous transport object		Kind of method applied
		GMA	<i>discontinuous transport object</i> horizontally	vehicle	car, cart, lorry, train, truck, wagon, wheelbarrow	
		GMB	<i>discontinuous transport object</i> vertically	elevator	hoist	
		GMC	<i>discontinuous transport object</i> lifting and moving objects vertically or horizontally	crane	forklift truck, shovel	
		GMD	<i>discontinuous transport object</i> placing objects together	palletizer	stacker	
		GME	<i>discontinuous transport object</i> turning a conveyed flow	turntable	luggage turntable, railway turntable	
		GMF	<i>discontinuous transport object</i> moving objects in a linear flow by vibrating	vibrating feeder		
	GP		<i>generating object</i> of liquid	liquid flow generating object	pump	Kind of method applied
		GPA	<i>liquid flow generating object</i> by cyclic displacement of a set quantity of liquid	positive displacement pump	peristaltic pump, piston pump, rotary gear pump, screw pump	
		GPB	<i>liquid flow generating object</i> by continuously providing a pressure differential between inlet and outlet	liquid velocity pump	axial flow circulation pump, centrifugal pump, impeller, radial-flow circulation pump	
		GPC	<i>liquid flow generating object</i> by transferring kinetic energy from one flow to another	hydraulic ram pump	eductor pump, hydram	
		GPD	<i>liquid flow generating object</i> by difference in potential energy between inlet and outlet	lubricator	oiler, siphon	
	GQ		<i>generating object</i> of gas	gaseous flow generating object		Kind of flow generating method
		GQA	<i>gaseous flow generating object</i> by forcing trapped gas to the discharge side	gas compressor	vacuum pump	