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Technical product documentation (TPD) — Representation and identification of situation features

Documentation technique de produits (DTP) — Représentation et identification des éléments de situation

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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 10, *Technical product documentation*, Subcommittee SC 1, *Basic conventions*.

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

This document is a technical product documentation (TPD) standard and regarded as a complementary standard.

One or more situation features can be assigned to any integral surface or collection of integral surfaces, depending on the invariance class it belongs to. Situation features are defined in ISO 17450-1 as being a point, a straight line or a plane. Altogether, the situation features allow for situating (i.e. either orienting or positioning, or both) the corresponding integral surface or collection of integral surfaces with respect to other geometrical features. This set of situation features can be reduced to a minimum set of one to three situation features, each being of a different type.

The purpose of this document is to standardize the means to graphically represent and identify the situation features of a single feature or of a compound feature (collection of features), thereby, explicitly indicating the relationship between an integral feature and its set of situation features.

Drawings and models are used in a variety of situations, e.g. functional design, manufacturing and verification (see ISO/TS 21619). In many cases, it can be challenging to communicate unambiguously when referencing in different documents a specific situation feature, whether orally or in writing, without depicting the part or specific details of the part that are not necessarily illustrated adequately on the drawing.

Furthermore, situation features identifiers can be used to clarify a TPD. They are also used in ISO GPS standards (see ISO 5459) as a means to clarify the expression of geometrical specifications. Human-readable identifiers for situation features are needed to ease the communication between stakeholders and clarify with respect to which situation features other situation features are specified, i.e. establish human-understandable traceability, and provide means to establish traceability between the drawing and other TPD. CAD-vendors are encouraged to implement a harmonized unique identifier for situation features to support the implementation of this document.

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Technical product documentation (TPD) — Representation and identification of situation features

1 Scope

This document defines, if needed, how to represent the situation features of an integral surface, or of a collection of integral surfaces, and how to identify them uniquely by an alphanumerical label in a technical product documentation (TPD). It also defines how to indicate the type of each situation feature or the type of each minimum set of situation features, and how to represent the positive direction of a situation feature.

Annex A defines the cases where the representation of situation features is not required.

Annex B defines how to represent the intrinsic mobilities inside a minimum set of situation features.

Annex C defines the proportions and dimensions of the graphical symbols to be used.

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 128-2:2022, *Technical product documentation (TPD) — General principles of representation — Part 2: Basic conventions for lines*

ISO 5459, *Geometrical product specifications (GPS) — Geometrical tolerancing — Datums and datum systems*

ISO 7499, *Technical product documentation (TPD) — Unique integral feature identification (UIFI)*

ISO 10209, *Technical product documentation — Vocabulary — Terms relating to technical drawings, product definition and related documentation*

ISO 81714-1, *Design of graphical symbols for use in the technical documentation of products — Part 1: Basic rules*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10209 and the following 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
situation feature
point, straight line, plane, from which the situation of a geometrical feature can be totally or partially defined

[SOURCE: ISO 17450-1:2011, 3.3.1.1.3, modified — In ISO 17450–1:2011, it is considered that a situation feature can also be a helix. That case is discarded in this document, see 6.3.5 and B.2.4.]

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3.2
minimum set of situation features
set of situation features consisting of at most one point, at most one straight line, and at most one plane, following the condition: point on straight line in plane

Note 1 to entry: When a minimum set of situation features consists of all three types of situation features, the set is called a "complete minimum set of situation features".

3.3
type of a minimum set of situation features
"point", or "straight line", or "plane", or "point in plane", or "point on line", or "line in plane", or "point on line in plane"

Note 1 to entry: These seven types of minimum sets of situation features are grouped into three categories: "minimum set of a single situation feature", "minimum set of a pair of situation features", and "complete minimum set of situation features", see Table 5.

3.4
identifier of the type of a minimum set of situation features
type identifier
identifier of the type of a single situation feature, or minimum set of a single situation feature (two letters between square brackets "[ ]"), or of the type of a minimum set of situation features made up of more than one situation feature (a combination of the letters identifying a single situation feature and of slash signs "/", between square brackets "[ ]")

Note 1 to entry: The list of type identifiers is given in Table 5.

4 Elements for the representation and identification of situation features

When situation features of an integral feature (single or compound, considered or not as a datum feature) are indicated in the TPD (3D model or 2D drawing), they shall be represented and identified with the following elements:

— the explicit representation according to the rules defined in Clause 5;

— the identification, as defined in Clause 6.

Annex A shall be used when a situation feature is implicitly represented and then does not require an explicit representation and identification.

Annex B shall be used to represent the intrinsic mobilities inside a minimum set of situation features.

5 Graphical symbols for the representation of situation features

5.1 Single situation feature and minimum set of a single situation feature

The explicit nominal representation of a single situation feature, or of a minimum set of a single situation feature (set of only one situation feature, of type "point", or of type "straight line", or of type "plane"), shall be made in accordance with Table 1.

Type identifiers are defined in Table 5.

The proportions and dimensions of the graphical symbols shall follow Annex C.

A situation feature of type "point" shall be represented by a wide line cross, either of standard height or of extended height. The choice of the type of cross to be used in TPD shall be determined by the visibility. The default representation shall be with a wide line cross of standard height.

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