



International
Standard

ISO 24096-1

**Technical product documentation
(TPD) — Classification of
requirements —**

**Part 1:
Framework**

*Documentation technique de produits (TPD) — Classification des
exigences —*

Partie 1: Cadre

**First edition
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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.

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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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 10, *Technical product documentation*, Subcommittee SC 6, *Mechanical engineering documentation*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/SS F01, *Technical drawings*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 24096 series can be found on the ISO website.

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.

Introduction

This document addresses the classification of requirements. It provides a framework for building systems to enable the classification of requirements and an indication of the classification in the functional specification, FUN-SPEC, to support communication of the consequences of nonconformity to functional requirements. FUN-SPEC (see ISO/TS 21619) is a part of the technical product documentation (TPD). Other approaches than classification of requirements can be state of the art in achieving the objective of securing the end product.

This document has been developed mainly to be implemented within industry, e.g. the automotive and aerospace industries. However, it can also be used in other engineering fields.

Classification of requirements is a tool by which subsequent parties and stakeholders can be informed of the level of consequences of nonconformity of requirements. This facilitates the guiding of production and quality assurance resources (e.g. purchasing, production planning, control, revision). The classification system relies on established procedures, regulatory framework and contractual agreements for implementation and follow up as present in all modern industry.

There are several examples of industrial stakeholders that deploy their own or partially self-developed system and methodology for classification of requirements. There has previously not been any ISO document that pragmatically describes “what is” and “how to create” a classification system. This series bridges the identified gap and meets the need to describe how to introduce and work with a classification system in an industrial and design context.

Knowledge of the consequences of nonconformity, with requirements and actions taken to resolve the source of the deviation from the given requirements, will have a positive effect on product quality, user safety and economy of the product. Production and inspection resources can then be used where they are most needed.

[Annex A](#) gives guidance for class implication and system application.

[Annex B](#) gives guidance for indication, definition of requirement classes and the selection of symbols.

[Annex C](#) gives guidance for indication in TPD and placing of symbols.

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Technical product documentation (TPD) — Classification of requirements —

Part 1: Framework

1 Scope

This document specifies a framework for building systems for the classification of requirements. Such systems can be used to indicate requirements of special importance, and communicate them for production set-up, verification, audit, etc.

This document:

- gives background information why such systems are useful in many areas of manufacturing;
- can be referred to for the concept of classification of requirements;
- functions as a framework for applying such systems in technical product documentation (TPD);
- indicates the needed elements for a classification system;
- supports with aspects in the choice of symbols for a classification system.

As a framework, this document does not give the details of a specific classification system. Instead, it functions as a basis for an organization-specific system which contains details such as notations and symbols, classification levels, assessment procedures, etc., including usage and interpretation in the TPD.

This document does not specify the contractual consequences of a classification (e.g. needed actions such as choice of tools, reliability index or process capability for a classification level) nor other references to standards or documents for handling classifications and nonconformity to requirements.

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 8015:2011, *Geometrical product specifications (GPS) — Fundamentals — Concepts, principles and rules*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8015:2011, 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 requirement

statement which translates or expresses a need and its associated constraints and conditions

Note 1 to entry: Requirements exist at different levels in the system structure.

Note 2 to entry: A requirement is an expression of one or more particular needs in a very specific, precise and unambiguous manner.

Note 3 to entry: A requirement always relates to a system, software or service, or other item of interest.

[SOURCE: ISO/IEC/IEEE 29148:2018, 3.1.19]

3.2 requirement class

element in a technical product *requirement* ([3.1](#)) which indicates a level of *severity* ([3.4](#))

Note 1 to entry: The lowest requirement class is called “baseline” and usually not marked in the technical product documentation.

3.3 requirement classification system

organization of *requirement classes* ([3.2](#)) with described interdependencies and symbols

3.4 severity

gravity of possible consequence of nonconformity

4 Basic rules

4.1 General

The framework in this document describes the needed components in a complete classification system.

With a classification system and through indication of classified requirements, it is possible to give information about the consequences of nonconformity with these requirements. However, classification systems based on this document do not give exemptions to deviate from any requirements.

All requirements in the product documentation shall be fulfilled in accordance with ISO 8015:2011, 4.3 and 4.4.

A classification system is a tool to indicate critical requirements in order to facilitate quality assurance downstream in the design departments.

A classification system shall contain a description of the indications (see [Annex A](#) for examples), criteria for classification levels and an explanation on how to document a classification. A classification system can be constructed with levels and/or types of consequences of nonconformity with requirements.

The design goal should always be to have a robust design, in which variations occurring in, for example, production do not cause critical effects, and thereby render this type of marking redundant.

The requirements to be secured are usually customer requirements such as economy, safety and environment. They are usually difficult to measure in production and therefore not suitable for production follow up and quality control. Customer requirements on the product are met through product requirements (including regulatory requirements). They in turn are met through functional requirements, characteristic requirements and ultimately parameter requirements, see [Figure 1](#).

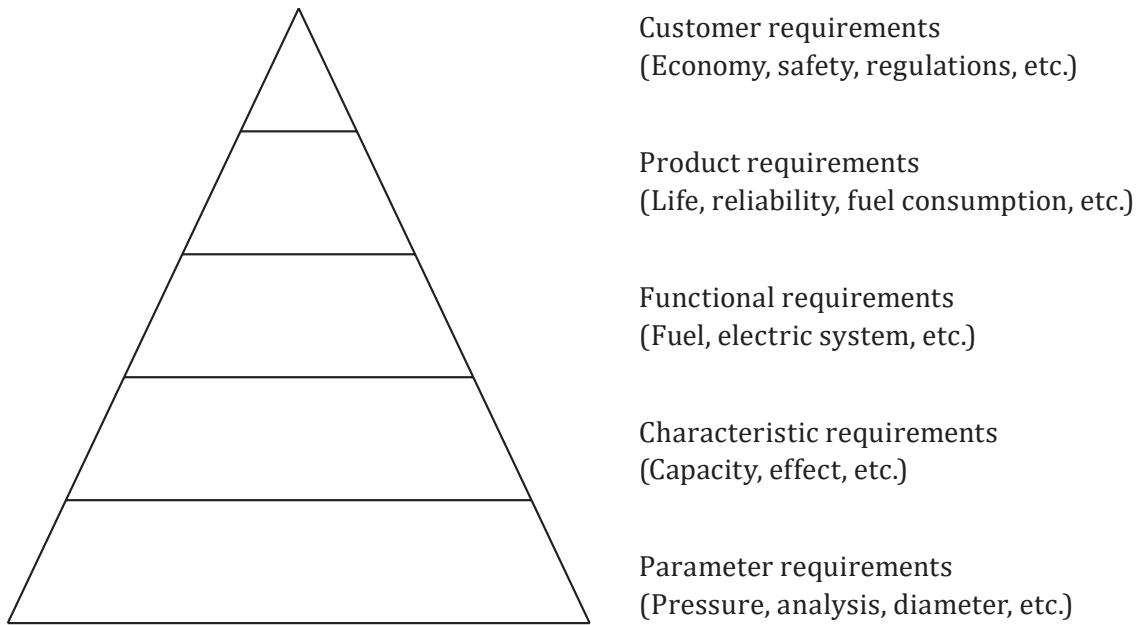


Figure 1 — Requirement pyramid

4.2 Description of requirement class

This type of requirement classification system defines the levels of severity at nonconformity and how to communicate the consequences.

The definition of a requirement class shall indicate a level of consequence at nonconformity in terms of, for example, product non-function, risk for personal injury or that downstream/subsequent production processes can be impaired. The product's function is central, and "function" shall be understood in the widest sense of the word. It means that subfunctions expressed through sub-requirements such as safety, mountability, reliability, interchangeability, appearance, etc. are included.

A requirement class can also indicate the areas that are affected (such as production, safety regulations, legal requirements, certification or other regulations) and whether documentation of requirement fulfilment is mandatory.

Numbers, letters, words or other symbols can be used as class identifiers. Keyboard characters have the advantage of being readily available, while specific symbols stand out to a higher degree. Examples of classification systems are given in [Tables A.1](#) and [B.1](#).

4.3 Use of a classification system

Due to the variety of already existing solutions, this document is a framework which can help individual organizations when deciding on their own classification system and how to use it in the TPD. It is possible to use an already existing system, develop a new one or modify an existing one.

NOTE Severity with a requirement as the sole basis for classification can lead to an excessive number of classified requirements. Additional parameters, such as susceptibility, can therefore be useful, as described in ISO 24096-2.

4.4 Application

This document can only be used as a basis for an organization-specific system which contains the explicit classification and the symbology used in the TPD. Therefore, it cannot be used as a standalone reference.

4.5 Definition of classification levels

The definition of each class should be given independent of the type of product and production process, see examples in [Annex B](#).

Implication of a classification shall be described directly or indirectly in the classification system. The classification system can also describe who is responsible for classifying requirements.

The classification level will define the appropriate production and inspection setup. The production process can also cover the obtaining of materials, semi-manufactures and products supplied by sub-contractors.

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