INTERNATIONAL STANDARD

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Fluid power — Specification of reference dictionary —

Part 1:
General overview on organization and structure

Transmissions hydrauliques et pneumatiques — Spécification d'un dictionnaire de référence —

Partie 1: Aperçu général sur l'organisation et la structure

PROOF/ÉPREUVE

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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 documents 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 on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 131, *Fluid power systems*, Subcommittee SC 1, *Symbols, terminology and classifications*.

ISO 18582 consists of the following parts, under the general title *Fluid power — Specification of reference dictionary*:

— *Part 1: General overview on organization and structure*

Part 2 and Part 3 will be prepared after the release of this part of ISO 18582. It has to be discussed if Part 2 and Part 3 should be subdivided into further parts, e.g. *Classes' and properties' definitions for pneumatics* or *Classes' and properties' definitions for hydraulic valves*.

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Introduction

Modern business operations — known collectively as e-Business and including e-Marketplaces, e-Product catalogues and Lifecycle Management — are characterized by the following.

a) **Complex structures of the product lifecycle**

In each step of the product lifecycle (ranging from the first idea through development, manufacture, distribution, use and disposal of the product), information from another step or steps is required; moreover, new additional information is generated. Numerous parties and processes are involved in or form part of the product lifecycle. Hence, information needs to be transferred to or exchanged between those parties and processes, across company internal interfaces and across interfaces to external business partners (such as other manufacturers, suppliers and customers).

To ensure successful handling of these business operations, it is essential that the communication between parties and processes involved be independent from individual agreements on data and that the data, once created, be readily usable by other parties and in other processes without a need for conversion mechanisms.

b) **Availability of new electronic media**

To take advantage of the economic potential of these new media, product information provided by various suppliers needs to be clear and unambiguous (inter-comparable) for a potential buyer.

The requirement arising from both of these aspects is that the description of products and processes are:

— uniformly consistent and unambiguous;

— neutral (neither company-specific nor software-specific nor product-specific);

— available in electronic form for ready use without conversion.

This is generally true for any business area.

For the business area of fluid power systems, the situation that led to the decision to prepare ISO 18582 were:

a) available ISO Standards, such as the ISO 5598, provide some verbal definitions of properties, but do not provide sufficient detail of information required for an unambiguous data exchange;

b) programs (i.e. software, either commercially available or custom-made) used in different areas of a single company or amongst business partners (e.g. CAD-Systems, ERP-Systems, Office Tools) use different interfaces and different internal data representation (e.g. measurement unit, reference value); any attempt to exchange data between them requires multi-directional conversion mechanisms or is associated with a risk of introducing errors or simply is impossible.

On the basis of standardized and electronically available properties, data exchange between, and immediate use of transmitted data in, the software used in various departments or branches of one company or at various business partners can be implemented. Use of standardized properties increases process comprehensiveness at companies and permits closer IT-based links between customers and suppliers in the areas of development and supply. This, in turn, leads to cost savings by way of cuts in the number of required parts and shorter product-development time frames.

Though limited to the field of fluid power, the reference dictionary needs to include all relevant properties required for the full description of fluid power products and processes. Therefore, in addition to the properties that are peculiar to the field of fluid power systems, the reference dictionary also includes, be it by specification or be it by reference from other dictionaries, properties being of universal nature rather than specific to "fluid power systems", e.g. quantities and units or fundamental physical entities, and the required properties from other technical fields, e.g. mechanical components such as mountings for fluid power elements, if they are not defined elsewhere (i.e. in ISO 23584) and so cannot be referenced.

In the interests of utmost effectiveness, the reference dictionary and its entire content should be made available in electronic form, ready for import into and use in a user's application system.

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Fluid power — Specification of reference dictionary —

Part 1:
General overview on organization and structure

1 Scope

This part of ISO 18582 provides the basis for the preparation of a reference dictionary of standardized product properties for the area of fluid power, and for the provision of this reference dictionary and its entire contents in electronic form.

This part of ISO 18582, based on ISO 13584-42 and ISO/IEC Guide 77-2, specifies a reference dictionary of standardized product properties for the area of fluid power.

NOTE   The properties are determined on the basis of standardized attributes. To ensure optimum unambiguity, the standardized properties are classified into definition classes, forming a so-called standardized "reference hierarchy".

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 80000 (all parts), *Quantities and units*

ISO 13584-42, *Industrial automation systems and integration — Parts library — Part 42: Description methodology: Methodology for structuring parts families*

ISO/IEC Guide 77-2, *Guide for specification of product properties and classes — Part 2: Technical principles and guidance*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13584-42 and ISO/IEC Guide 77-2 apply.

NOTE   Some basic definitions and principles given in ISO Guide 77-2 are provided in <u>Annex A</u> for information.

4 Principles of specification

4.1 Set of attributes for description of a property

Properties shall be described by attributes as given in <u>Table 1</u>.

NOTE   The table contents are in accordance with the data model specified in ISO 13584-42, expanded where required as per ISO/IEC Guide 77-2.

Table 1 — Set of attributes for description of a property (ISO/IEC Guide 77-2)

Attribute	Mandatory	Translation possible
Code	Y	N
Version	Y	N
Definition class	Y	N
Revision	Y	N
Date of original definition	Y	N
Date of current version	Y	N
Date of current revision	Y	N
Preferred name	Y	Y
Synonymous name	N	Y
Short name	N	Y
Definition	Y	Y
Source document of definition	N	Y
Note	N	Y
Remark	N	Y
Preferred symbol	N	N
Synonymous symbol	N	N
Figure	N	N
Property type classification	N	N
Domain	Y	N
Formula	N	N
Depends on	N	N
Value format	N	N
Unit of measure	Y/N	N
Alternative unit	N	N

4.2   Set of attributes for description of a class

Classes shall be described by attributes as given in Table 2.

NOTE   The table contents are in accordance with the data model specified in ISO 13584-42, expanded where required in accordance with ISO/IEC Guide 77-2.

Table 2 — Set of attributes for description of a class (ISO/IEC Guide 77-2)

Attribute	Mandatory	Translation possible
Code	Y	N
Version	Y	N
Information supplier	Y	N
Revision	Y	N
Date of original definition	Y	N
Date of current version	Y	N
Date of current revision	Y	N
Preferred name	Y	Y
Synonymous name	N	Y
Short name	N	Y
Definition	Y	Y

Table 2 *(continued)*

Attribute	Mandatory	Translation possible
Source document of definition	N	Y
Note	N	Y
Remark	N	Y
Superclass	N	N
Applicable properties	N	N
Applicable types	N	N
Figure	N	N
Subclass selectors	N	N
Class selector values	N	N

4.3 Basic structure of reference dictionary

4.3.1 General

For an unambiguous specification, each property requires a defined context. In accordance with the data model, this context is provided by allocation of each property to an associated definition class.

The definition class is one of the mandatory attributes of a property.

When strictly applying the rules of the data model specified in ISO 13584-42, it is impossible to end up with object classes that describe objects in all detail. Therefore, a clear distinction shall be drawn between definition classes and application classes. The properties defined within the definition classes of the property dictionary can, i.e. in the sense of their defined context, be used in any application class.

Within the hierarchic structure of definition classes and within the hierarchic structure of application classes, the rules of heredity, in accordance with the data model of ISO 13584-42, apply.

4.3.2 Basic structure of the hierarchic order of the definition classes

The basic structure of the hierarchic order of definition classes of this part of ISO 18582 is adapted from the ICS (International Classification of Standards).

To achieve compatibility with the data model of ISO 13584-42, ICS classes are given a verbal definition and are related to each other by introduction of appropriate classifying properties. The ICS structure is modified to eliminate classes such as "miscellaneous".

On the top level order of the ICS, besides generalities/terminology/standardization (ICS 01), we have the sciences and the industry sectors. Properties shall always be allocated to the most general possible class (here, ICS class), that is, if a property cannot be allocated to ICS 01 and its subclasses, consideration shall be given to its allocation to the relevant science class, and only if this is not possible shall it be allocated to the relevant industry sector class.

4.3.3 Allocation of properties for basic quantities within the hierarchic order of definition classes

In order to prevent contradicting properties' definitions, basic quantities shall be defined as general as possible. For physical quantities, the specification of properties shall be in accordance with ISO 80000 (all parts) and the properties shall be allocated to the definition class "general terminology" in ICS 01.

If necessary, for a specific area of application, a refinement can be made starting from those properties for basic quantities available under the ICS 01 definition class. This can be done, for example, for the introduction of conditions, restriction of value range, etc. Such refinement leads to additional (new) properties.