
**Health informatics — Identification
of medicinal products —
Implementation guidelines for data
elements and structures for the
unique identification and exchange of
regulated information on substances**

*Informatique de santé — Identification des médicaments — Lignes
directrices pour la mise en oeuvre des éléments de données et
structures pour l'identification unique et l'échange d'informations
réglementées sur les substances*

ISO/TS 19844:2016

<https://standards.iteh.ai/catalog/standards/iso/eedf25be-b6c7-444c-8eec-dbb3cb77a260/iso-ts-19844-2016>



iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO/TS 19844:2016

<https://standards.iteh.ai/catalog/standards/iso/eedf25be-b6c7-444c-8eec-dbb3cb77a260/iso-ts-19844-2016>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

1	Scope	1
2	Normative references	2
3	General background and history	2
4	Substance (Mandatory)	3
4.1	General	3
4.2	Defining substances	5
4.2.1	Substance type (Mandatory)	7
4.2.2	Substance ID (Mandatory)	10
4.3	Substance names (Mandatory)	11
4.3.1	Substance name	12
4.3.2	Substance name type	13
4.3.3	Language	14
4.3.4	Official name (Conditional)	14
4.4	Reference source (Conditional)	17
4.4.1	Public domain	17
4.4.2	Reference source type	18
4.4.3	Reference source class	18
4.4.4	Reference source ID	19
4.4.5	Reference source citation	19
4.5	Reference source document (Conditional)	19
4.5.1	Public domain	19
4.5.2	Reference source document	20
4.5.3	Reference source document type	20
4.5.4	Reference source document ID	21
4.5.5	Reference source document classification	21
4.5.6	Reference source document URL	21
4.6	Substance code (Conditional)	21
4.6.1	Code	22
4.6.2	Code system	22
4.6.3	Code system ID	23
4.6.4	Code system status	23
4.6.5	Code change date	24
4.6.6	Comment	24
4.6.7	Reference source	24
4.7	Reference information (Conditional)	24
4.7.1	Comment	25
4.7.2	Substance classification (Conditional)	25
4.7.3	Substance relationship (Conditional)	28
4.7.4	Target (Conditional)	30
4.7.5	Gene (Conditional)	33
4.7.6	Gene element (Conditional)	35
4.8	Structure	36
4.8.1	Structural Representation (Conditional)	36
4.8.2	Stereochemistry	42
4.8.3	Optical activity	43

4.8.4	Molecular Formula	44
4.8.5	Molecular Formula by Moiety	44
4.8.6	Molecular weight (Mandatory)	44
4.8.7	Isotope (Conditional)	44
4.9	Amount (Conditional)	46
4.9.1	Average	46
4.9.2	Low limit	47
4.9.3	High limit	47
4.9.4	Unit	47
4.9.5	Non-numeric Value	48
4.9.6	Reference Source (Conditional)	48
4.9.7	Reference source document (Conditional)	48
4.10	Source material (Conditional)	48
4.10.1	Source material class	49
4.10.2	Source material type	50
4.10.3	Source material state	50
4.10.4	Organism ID	50
4.10.5	Organism name	51
4.10.6	Parent substance ID	51
4.10.7	Parent substance name	51
4.10.8	Development stage	52
4.10.9	Part Description (CONDITIONAL)	52
4.10.10	Fraction (Conditional)	54
4.10.11	Organism (Conditional)	57
4.11	Modification (Conditional)	64
4.11.1	Modification type	66
4.11.2	Residue modified	66
4.11.3	Residue sites	66
4.11.4	Structural modification (Conditional)	67
4.11.5	Agent modification (Conditional)	69
4.11.6	Physical Modification (Conditional)	70
4.12	Property (Conditional)	72
4.12.1	Property type	72
4.12.2	Property name	73
4.12.3	Property parameters	73
4.12.4	Substance ID	73
4.12.5	Substance name	74
4.12.6	Amount type (Mandatory)	74
4.13	Version (Mandatory)	74
4.13.1	Version number	74
4.13.2	Effective date	75
4.13.3	Change made	75
5	Substance definitions	75
5.1	Chemical substance	75
5.1.1	Comment	76
5.1.2	Structure	77
5.1.3	Stoichiometric/Non-stoichiometric chemicals	77
5.1.4	Stoichiometric chemicals	78
5.1.5	Non-stoichiometric chemicals (Conditional)	81
5.1.6	Substance Name (Mandatory)	83
5.1.7	Substance Code (Conditional)	83
5.1.8	Version (Mandatory)	83

5.1.9	Reference information.....	83
5.1.10	Reference source (Conditional).....	83
5.1.11	Reference source document (Conditional)	83
5.2	Proteins/peptides	83
5.2.1	Microheterogeneity	84
5.2.2	Sequence type	86
5.2.3	Number of subunits.....	86
5.2.4	Disulfide linkage	86
5.2.5	Comment.....	87
5.2.6	Protein subunit (Mandatory)	87
5.2.7	Molecular weight (Conditional)	90
5.2.8	Glycosylation (Conditional)	91
5.2.9	Property (Conditional)	92
5.2.10	Structure (Mandatory).....	93
5.2.11	Substance name (Mandatory)	93
5.2.12	Modification (Conditional).....	93
5.2.13	Substance code (Conditional)	93
5.2.14	Source material (Conditional)	93
5.2.15	Version (Mandatory)	93
5.2.16	Reference information (Conditional).....	93
5.2.17	Reference source (Conditional).....	93
5.2.18	Reference source document (Conditional)	93
5.3	Nucleic acids	93
5.3.1	Structure (Conditional)	94
5.3.2	Sequence type	95
5.3.3	Number of subunits.....	95
5.3.4	Area of hybridisation.....	96
5.3.5	Comment.....	96
5.3.6	Nucleic acid subunit (Mandatory)	96
5.3.7	Modification (Conditional).....	100
5.3.8	Property (Conditional)	100
5.3.9	Molecular weight (Conditional)	101
5.3.10	Substance Name (Mandatory).....	101
5.3.11	Substance Code (Conditional)	101
5.3.12	Version (Mandatory)	101
5.3.13	Reference information (Conditional).....	101
5.3.14	Reference source (Conditional).....	101
5.3.15	Reference source document (Conditional)	101
5.4	Polymers	101
5.4.1	Polymer class	103
5.4.2	Polymer geometry	103
5.4.3	Copolymer sequence type.....	103
5.4.4	Comment.....	103
5.4.5	Substance name (Mandatory)	103
5.4.6	Structure (Mandatory).....	104
5.4.7	Monomer description (Conditional).....	104
5.4.8	Structural repeat (Conditional).....	105
5.4.9	Molecular weight (Mandatory).....	108
5.4.10	Property (Conditional)	108
5.4.11	Substance code (Conditional)	108
5.4.12	Version (Mandatory)	108
5.4.13	Reference information (Conditional).....	108

5.4.14	Modification (Conditional)	108
5.4.15	Source material (Conditional).....	109
5.4.16	Reference source (Conditional)	109
5.4.17	Reference source document (Conditional).....	109
5.5	Structurally diverse substances.....	109
5.5.1	Comment	110
5.5.2	Substance name (Mandatory).....	110
5.5.3	Structure (Mandatory)	110
5.5.4	Property (Conditional).....	110
5.5.5	Molecular weight.....	111
5.5.6	Glycosylation (Conditional).....	111
5.5.7	Modification (Conditional)	111
5.5.8	Source material (Conditional).....	111
5.5.9	Substance code (Conditional)	111
5.5.10	Reference information (Conditional)	111
5.5.11	Version (Mandatory)	111
5.5.12	Reference source (Conditional)	111
5.5.13	Reference source document (Conditional).....	111
5.5.14	Herbals and substances used in the preparation of plant-based allergenic extracts	111
5.5.15	Vaccines	114
5.5.16	Plasma-derived substance for human blood products and polyclonal antibodies.....	114
5.5.17	Allergens.....	114
5.5.18	Advance Therapies and Advanced Vaccines (Genes, Modified Viruses, Cells and Tissues as Substances)	115
5.5.19	Minerals.....	115
5.6	Mixture substance.....	116
5.6.1	Mixture type	116
5.6.2	Mixture constituent (Mandatory)	116
5.6.3	Modification (Conditional)	117
5.6.4	Source material (Conditional).....	117
5.6.5	Substance name (Mandatory).....	117
5.6.6	Substance code (Conditional).....	117
5.6.7	Reference information (Conditional)	118
5.6.8	Version (Mandatory)	118
6	Specified substance (Optional)	118
6.1	Specified Substance Group 1 (repeat as necessary)	118
6.1.1	Specified substance Group 1 ID.....	119
6.1.2	Specified substance Group1 Name.....	120
6.1.3	Substance Name (Mandatory)	120
6.1.4	Substance Code (Conditional).....	120
6.1.5	Version (Mandatory)	120
6.1.6	Reference source (Conditional)	120
6.1.7	Reference source document (Conditional).....	120
6.1.8	Property (Conditional).....	120
6.1.9	Fraction (Conditional).....	121
6.1.10	Modification (Conditional)	125
6.1.11	Reference Information (Conditional)	125
6.1.12	Constituent (Mandatory).....	125
6.1.13	Physical form (Conditional)	127
6.1.14	Specified substance particulars	128
6.2	Specified substance Group 2	133
6.2.1	Specified Substance Group2 ID	135

6.2.2	Specified Substance Group2 Name	136
6.2.3	Parent Substance ID.....	136
6.2.4	Reference source (Conditional).....	136
6.2.5	Reference source document (Conditional)	136
6.2.6	Manufacturing (Mandatory)	136
6.3	Specified Substance Group 2 for Herbal preparations.....	142
6.3.1	Specified Substance Group2 ID	142
6.3.2	Specified substance Group2 Name	142
6.3.3	Parent Substance ID.....	142
6.3.4	Manufacturing.....	143
6.3.5	Version.....	144
6.4	Specified Substance Group 3	144
6.4.1	Specified Substance Group 3 ID	145
6.4.2	Specified Substance Group3 Name	145
6.4.3	Parent Substance ID.....	145
6.4.4	Grade (Mandatory).....	145
6.4.5	Version (Mandatory)	146
6.4.6	Reference source (Conditional).....	146
6.4.7	Reference source document (Conditional)	147
6.4.8	Substance name (Mandatory)	147
6.4.9	Substance code (Conditional)	147
6.4.10	Version (Mandatory)	147
7	Description of the information modelling principles and practices.....	147
Annex A (normative)	Choosing a Substance ID	148
Annex B (normative)	Chemical substance	150
Annex C (normative)	Protein substance.....	270
Annex D (normative)	Nucleic acid substance	329
Annex E (normative)	Structurally Diverse Substance – Herbal Substance/Herbal Specified Substance.....	348
Annex F (normative)	Structurally Diverse Substance, Homeopathic substance	466
Annex G (normative)	Structurally Diverse Substance – Plasma-derived substances.....	509
Annex H (normative)	Polymer Substance.....	581

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 215, *Health informatics*.

This second edition cancels and replaces the first edition (ISO/TS 19844:2015), which has been technically revised.

Introduction

This document provides guidelines for implementing ISO 11238. This document is developed in response to a worldwide demand for guidance on the implementation of internationally harmonised specifications for medicinal products. It is one of a group of four implementation guides for a total of five ISO standards which together provide the basis for the unique identification of medicinal products. The other standards in this group are:

- ISO 11615, *Health informatics — Identification of medicinal products — Data elements and structures for the unique identification and exchange of regulated medicinal product information*
- ISO 11616, *Health informatics — Identification of medicinal products — Data elements and structures for the unique identification and exchange of regulated pharmaceutical product information*
- ISO 11239, *Health informatics — Identification of medicinal products — Data elements and structures for the unique identification and exchange of regulated information on pharmaceutical dose forms, units of presentation, routes of administration and packaging*
- ISO 11240, *Health informatics — Identification of medicinal products — Data elements and structures for the unique identification and exchange of units of measurement*

The standards for the Identification of Medicinal Products (IDMP) support the activities of medicines regulatory agencies worldwide by jurisdiction. These include a variety of regulatory activities related to development, registration and life cycle management of medicinal products as well as pharmacovigilance and risk management.

The business objective of this implementation guide is to provide a means for exchanging regulatory substance information. To meet the primary objectives of the regulation of medicines and pharmacovigilance, it is necessary to exchange medicinal product information in a robust and reliable manner.

For the purposes of this document, all conditions (e.g. mandatory, conditional, optional) correspond to the necessary requirements to uniquely and unambiguously identify a substance. Implementation of the ISO IDMP standards may dictate that mandatory elements for identification be tagged as conditional or optional, based on regional requirements. If a subclause is identified as 'optional' but is implemented in a specific region, conformance described within that subclause is applicable. The scope of this document is to identify the scientifically necessary elements for the unique identification of Substances/Specified Substances.

Health informatics — Identification of medicinal products — Implementation guidelines for data elements and structures for the unique identification and exchange of regulated information on substances

1 Scope

This document is used in the implementation of ISO 11238. This document defines substances based on their scientific identity (i.e. what they are) rather than on their use or method of production.

ISO 11238 provides the conceptual framework for defining Substances and Specified Substances and for assigning unique identifiers in the context of the ISO IDMP standards. ISO 11238 describes general concepts for defining and distinguishing substances and a high level model for the structuring of information for substances. This document provides detailed explanations of each type or grouping of substance information, an element-by-element description for implementation of ISO 11238, and examples for a variety of Substances and Specified Substances.

This second edition of the document addresses substances, Groups 1 to 3 of the Specified Substances as defined in ISO 11238 and Annexes A, B, C, D, E, F, G and H. It is anticipated that Specified Substances Group 4, as defined in ISO 11238, will be addressed in a subsequent edition of this document. Some information that would typically fall under Specified Substances Group 4 may be covered in the Annexes of this document. This information, although not defining of either a Substance or a Specified Substance Group 1, may be essential to distinguishing substances. This document addresses the following:

- Data elements necessary for defining Substances and Specified Substances Groups 1 to 3;
- The logical use of data elements as defined in ISO 11238;
- Substances and Specified Substances Groups 1 to 3 business rules for
 - determining necessary data elements,
 - distinguishing and defining materials according to ISO 11238,
 - triggering the assignment of identifiers.

This document does not address the following:

- Business processes for data management;
- Implementation of a specific data information system (e.g. a relational database schema);
- Normative messaging standards for substances;
- The maintenance of controlled vocabularies;
- The specific global identifier system that should be used;
- Nomenclature standards for substances.

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 8601, *Data elements and interchange formats — Information interchange — Representation of dates and times*

ISO 11238, *Health informatics — Identification of medicinal products — Data elements and structures for the unique identification and exchange of regulated information on substances*

3 General background and history

Due to the lack of a common and harmonised approach to define substances, regulators and pharmaceutical industry are faced with the inability to:

- 1) effectively exchange medicinal substance information in a structured and efficient way;
- 2) ensure data consistency and evaluate/compare information across regions, which especially impairs pharmacovigilance and compliance activities;
- 3) develop consistent terminology for use throughout the healthcare community.

The objectives of the IDMP standards are to address the issues outlined above by developing harmonised standards that build on the regulatory and technical processes already established and to support the population and maintenance of existing systems/applications with fully reliable regulatory medicinal product information.

Harmonised standards will stimulate vendors to develop “off-the-shelf” tools (that are interoperable due to the standard itself). Harmonised standards will also help to maximise forward compatibility of data and minimise the complexities of backward compatibility.

This implementation guide is intended to assist reporters (including pharmaceutical companies, regulatory authorities and non-commercial sponsors) in constructing messages or transmitting information that allows substances to be defined unambiguously and assigned unique IDs. It also provides guidance to help choose the correct Substance ID from a public data source that provides unique Substance and Specified Substance identifiers. It is anticipated that an extensive list of substance identifiers as well as the definitional elements upon which the ID was based will be provided. This document is not intended to be a guide for a maintenance organisation. The maintenance organisation may also create alternative methods to submit information consistent with the ISO model.

Table 1 is an example table for class and elements description.

Table 1 — Example table for class and element description

User Guidance	
Example(s)	
Conformance	
Data Type	
Values Allowed	
Business Rule(s)	

In contrast to other parts of the guide, conformance refers to whether an element is required for a given substance type or a Specified Substance Group. Conformance is not meant to be applied globally to all types of messages.

Definition: Conformance will be expressed based on the following terminology: Mandatory, Conditional and Optional.

Mandatory: refers to data elements that are required and shall therefore be implemented.

Conditional: refers to data elements that are subject to business rules and may become required by:

- data rules;
- process rules;
- regional rules.

Optional: refers to data elements that are informative but not definitional.

The description on whether a data element is conditional by data, by process or by regional rule is out of scope of this document and will be defined within regional implementation guides.

The information provided in the table refers to the global guidance. When there is no information in the conformance table row (e.g. information on business rule is not provided), please refer to the regional implementation guide.

4 Substance (Mandatory)

4.1 General

All medicinal products consist of substances; these substances can be active ingredients, excipients, or packaging materials. There are two fundamental levels of information described in ISO 11238, a "Substance level" and a "Specified Substance level". Both levels are included in the more generic concept of an ingredient. At the Substance level, substances are defined based on inherent attributes rather than use or method of manufacture. At the Specified Substance level, four separate groups of elements provide additional information.

In order to define or distinguish material either at a Substance or Specified Substance level, a number of attributes should be taken into consideration:

- For chemicals, the molecular structure is captured at the substance level;
- For proteins, the amino acid sequence, sites and type of glycosylation, and the presence and position of disulfide bonds are captured at the substance level;
- For nucleic acids, the sequence, type of sugar and linkage are captured at the Substance level;
- For other polymers, the monomers used to synthesize the polymer, the structural repeat units, the molecular weight and/or a property related to molecular weight (e.g. viscosity), the source of naturally derived polymers and any modifications that irreversibly alter the molecular structure are captured at the substance level;
- For structurally diverse material, taxonomic, anatomical and fractionation information, properties related to the underlying molecular structure of the material, and modifications that alter the underlying molecular structure are captured at the substance level;
- Mixture Substance consists of a simple combination of Single Substances that are either isolated together or are the result of the same synthetic process. The biological source of the mixture is also captured where relevant at the substance level. Proportions are not captured at the Substance level. It should be noted that a Mixture Substance description should only include the substances that are generally or consistently present in the material. This excludes impurities and degradants.

Other attributes will be specific to the Specified Substance levels:

- Constituent substances in a multi-substance material;
- Proportions of constituent substances in a multi-substance material;
- Physical state;
- Grade or purity of material;
- Manufacturing information;
- Analytical data.

There are four groups of elements that are used to further define and specify Substances. Specified Substances are always composed of at least one substance.

Specified substance Group 1 is typically used to define:

- Multi-substance materials consisting of multiple substances, which are not defined as mixture substances;
- Additional information regarding herbal and allergenic extracts;
- Physical state, including polymorphic forms;
- Detailed glycosylation information.

Specified Substance Group 2 is typically used to define:

- Manufacturer and the overall manufacturing process and critical process version number;