
**Information technology — Document
description and processing
languages — Office Open XML File
Formats —**

**Part 1:
Fundamentals and Markup Language
Reference**

*Technologies de l'information — Description des documents et
langages de traitement — Formats de fichier "Office Open XML" —
Partie 1: Principes essentiels et référence de langage de balisage*

ISO/IEC 29500-1:2016

<https://standards.iteh.ai/catalog/standards/iso/4b68b56c-c890-4f38-8c21-6f55e648977d/iso-iec-29500-1-2016>

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

ISO/IEC 29500-1:2016

<https://standards.iteh.ai/catalog/standards/iso/4b68b56c-c890-4f38-8c21-6f55e648977d/iso-iec-29500-1-2016>



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 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

Table of Contents

Foreword	viii
Introduction	x
1. Scope	1
2. Conformance	2
2.1 Document Conformance.....	2
2.2 Application Conformance	2
2.3 Application Descriptions	3
2.4 Interoperability Guidelines	5
3. Normative References	6
4. Terms and Definitions	10
5. Notational Conventions	13
6. Acronyms and Abbreviations	14
7. General Description	15
8. Overview	16
8.1 Content Overview	16
8.2 Packages and Parts	16
8.3 Consumers and Producers	16
8.4 WordprocessingML.....	16
8.5 SpreadsheetML.....	18
8.6 PresentationML.....	18
8.7 Supporting MLs	19
9. Packages	21
9.1 Office Open XML's Use of OPC.....	21
9.2 Relationships in Office Open XML	22
10. Markup Compatibility and Extensibility	27
11. WordprocessingML	28
11.1 Glossary of WordprocessingML-Specific Terms	28
11.2 Package Structure.....	28
11.3 Part Summary	31
11.4 Document Template	57
11.5 Framesets	58
11.6 Master Documents and Subdocuments	59
11.7 Mail Merge Data Source	60
11.8 Mail Merge Header Data Source	61
11.9 XSL Transformation	62
12. SpreadsheetML	64
12.1 Glossary of SpreadsheetML-Specific Terms	64
12.2 Package Structure.....	65

12.3	Part Summary	67
12.4	External Workbooks	102
13.	PresentationML	103
13.1	Glossary of PresentationML-Specific Terms	103
13.2	Package Structure	103
13.3	Part Summary	106
13.4	HTML Publish Location	124
13.5	Slide Synchronization Server Location	125
14.	DrawingML	127
14.1	Glossary of DrawingML-Specific Terms	127
14.2	Part Summary	127
15.	Shared	140
15.1	Glossary of Shared Terms	140
15.2	Part Summary	141
15.3	Hyperlinks	162
16.	Part Overview	164
16.1	WordprocessingML Summary	164
16.2	SpreadsheetML Summary	164
16.3	PresentationML Summary	165
16.4	DrawingML Summary	166
16.5	Shared Summary	166
17.	WordprocessingML Reference Material	169
17.1	Table of Contents	169
17.2	Main Document Story	189
17.3	Paragraphs and Rich Formatting	195
17.4	Tables	373
17.5	Custom Markup	485
17.6	Sections	547
17.7	Styles	614
17.8	Fonts	670
17.9	Numbering	692
17.10	Headers and Footers	734
17.11	Footnotes and Endnotes	747
17.12	Glossary Document	780
17.13	Annotations	798
17.14	Mail Merge	929
17.15	Settings	970
17.16	Fields and Hyperlinks	1158
17.17	Miscellaneous Topics	1293
17.18	Simple Types	1302
18.	SpreadsheetML Reference Material	1523
18.1	Table of Contents	1523
18.2	Workbook	1542
18.3	Worksheets	1589

18.4	Shared String Table.....	1717
18.5	Tables.....	1726
18.6	Calculation Chain	1742
18.7	Comments	1745
18.8	Styles.....	1752
18.9	Metadata	1801
18.10	Pivot Tables.....	1815
18.11	Shared Workbook Data	1959
18.12	QueryTable Data.....	1988
18.13	External Data Connections	1995
18.14	Supplementary Workbook Data	2016
18.15	Volatile Dependencies	2026
18.16	Custom XML Mappings.....	2031
18.17	Formulas	2039
18.18	Simple Types.....	2434
19.	PresentationML Reference Material	2516
19.1	Table of Contents	2516
19.2	Presentation	2522
19.3	Slides.....	2559
19.4	Comments	2597
19.5	Animation	2601
19.6	Slide Synchronization Data	2690
19.7	Simple Types.....	2691
20.	DrawingML - Framework Reference Material.....	2719
20.1	DrawingML - Main	2719
20.2	DrawingML - Picture	3087
20.3	DrawingML - Locked Canvas.....	3095
20.4	DrawingML - WordprocessingML Drawing.....	3096
20.5	DrawingML - SpreadsheetML Drawing.....	3152
21.	DrawingML - Components Reference Material.....	3181
21.1	DrawingML - Main	3181
21.2	DrawingML - Charts	3361
21.3	DrawingML - Chart Drawings.....	3469
21.4	DrawingML - Diagrams	3490
22.	Shared MLs Reference Material.....	3599
22.1	Math	3599
22.2	Extended Properties	3720
22.3	Custom Properties.....	3727
22.4	Variant Types.....	3729
22.5	Custom XML Data Properties	3740
22.6	Bibliography.....	3743
22.7	Additional Characteristics.....	3780
22.8	Office Document Relationships	3784
22.9	Shared Simple Types.....	3785
23.	Custom XML Schema References	3800

23.1	Table of Contents	3800
23.2	Elements	3800
Annex A. (normative) Schemas – W3C XML Schema		3805
A.1	WordprocessingML	3805
A.2	SpreadsheetML	3871
A.3	PresentationML	3955
A.4	DrawingML - Framework	3986
A.5	DrawingML - Components	4054
A.6	Shared MLs	4105
A.7	Custom XML Schema References	4129
Annex B. (informative) Schemas – RELAX NG		4131
B.1	WordprocessingML	4132
B.2	SpreadsheetML	4178
B.3	PresentationML	4273
B.4	DrawingML - Framework	4298
B.5	DrawingML - Components	4350
B.6	Shared MLs	4386
B.7	Custom XML Schema References	4402
B.8	Additional Resources	4403
Annex C. (informative) Additional Syntax Constraints		4405
Annex D. (informative) Namespace Prefix Mapping in Examples		4406
Annex E. (informative) WordprocessingML Custom XML Data Extraction		4408
Annex F. (normative) WordprocessingML Page Borders		4411
Annex G. (normative) Predefined SpreadsheetML Style Definitions		4412
G.1	Built-in Table Styles	4412
G.2	Built-in Cell Styles	4468
G.3	Built-in PivotTable AutoFormats	4472
Annex H. (informative) Example Predefined DrawingML Shape and Text Geometries		4488
Annex I. (informative) Bidirectional Support		4489
I.1	Introduction	4489
I.2	Shared (WordprocessingML and DrawingML)	4489
I.3	WordprocessingML	4491
I.4	SpreadsheetML	4494
I.5	PresentationML	4495
I.6	DrawingML	4495
I.7	The Unicode Bidirectional Algorithm and Office Open XML	4495
Annex J. (informative) Accessibility Best Practices		4499
J.1	The Value of Creating an Accessible Office Open XML Implementation	4499
J.2	Needs by Type of Disability	4500
J.3	Best Practices for Developers	4503
J.4	Best Practices for Document and Template Authors	4506
J.5	Best Practices for Customers of Office Open XML Implementations	4519

Annex K. (informative) Root Element Locations	4532
K.1 Grouped by Part Name	4532
K.2 Grouped by Schema Name	4534
Annex L. (informative) Primer	4538
L.1 Introduction to WordprocessingML	4538
L.2 Introduction to SpreadsheetML	4630
L.3 Introduction to PresentationML	4769
L.4 Introduction to DrawingML	4801
L.5 Introduction to VML	4960
L.6 Introduction to Shared MLs	4974
L.7 Miscellaneous Topics	5005
Annex M. (informative) Differences Between ISO/IEC 29500 and ECMA-376:2006	5016
M.1 WordprocessingML	5016
M.2 SpreadsheetML	5019
M.3 PresentationML	5020
M.4 DrawingML	5021
M.5 VML	5022
M.6 Shared	5022
M.7 Custom XML Schema References	5023
Bibliography	5024

Document Preview

ISO/IEC 29500-1:2016

<https://standards.iteh.ai/catalog/standards/iso/4b68b56c-c890-4f38-8c21-6f55e648977d/iso-iec-29500-1-2016>

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75% of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 29500-1 was prepared by ISO/IEC JTC 1, Information technology, Subcommittee SC 34, Document description and processing languages.

This fourth edition cancels and replaces the third edition (ISO/IEC 29500-1:2012), which has been technically revised by incorporation of the Technical Corrigenda ISO/IEC 29500-1:2012/Cor.1:2015 and ISO/IEC 29500-1:2012/Cor.2:2016.

ISO/IEC 29500 consists of the following parts, under the general title *Information technology — Document description and processing languages — Office Open XML File Formats*:

- *Part 1: Fundamentals and Markup Language Reference*
- *Part 2: Open Packaging Conventions*
- *Part 3: Markup Compatibility and Extensibility*
- *Part 4: Transitional Migration Features*

Annexes A, F and G form a normative part of this Part of ISO/IEC 29500. Annexes B–E and H–M are for information only.

This Part of ISO/IEC 29500 includes five annexes (Annex A, Annex B, Annex F, Annex G, and Annex H) that refer to data files provided in electronic form.

The document representation formats defined by this Part are different from the formats defined in the corresponding Part of ECMA-376:2006. Some of the differences are reflected in schema changes, as shown in Annex M of this Part.

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

[ISO/IEC 29500-1:2016](https://standards.itih.ai/catalog/standards/iso/4b68b56c-c890-4f38-8c21-6f55e648977d/iso-iec-29500-1-2016)

<https://standards.itih.ai/catalog/standards/iso/4b68b56c-c890-4f38-8c21-6f55e648977d/iso-iec-29500-1-2016>

Introduction

ISO/IEC 29500 specifies a family of XML schemas, collectively called *Office Open XML*, which define the XML vocabularies for word-processing, spreadsheet, and presentation documents, as well as the packaging of documents that conform to these schemas.

The goal is to enable the implementation of the Office Open XML formats by the widest set of tools and platforms, fostering interoperability across office productivity applications and line-of-business systems, as well as to support and strengthen document archival and preservation, all in a way that is fully compatible with the existing corpus of Microsoft Office documents.

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

[ISO/IEC 29500-1:2016](https://standards.iteh.ai/catalog/standards/iso/4b68b56c-c890-4f38-8c21-6f55e648977d/iso-iec-29500-1-2016)

<https://standards.iteh.ai/catalog/standards/iso/4b68b56c-c890-4f38-8c21-6f55e648977d/iso-iec-29500-1-2016>

Information technology — Document description and processing languages — Office Open XML File Formats

Part 1:

Fundamentals and Markup Language Reference

1. Scope

ISO/IEC 29500 defines a set of XML vocabularies for representing word-processing documents, spreadsheets and presentations. On the one hand, the goal of ISO/IEC 29500 is to be capable of faithfully representing the pre-existing corpus of word-processing documents, spreadsheets and presentations that had been produced by the Microsoft Office applications (from Microsoft Office 97 to Microsoft Office 2008, inclusive) at the date of the creation of ISO/IEC 29500. It also specifies requirements for Office Open XML consumers and producers. On the other hand, the goal is to facilitate extensibility and interoperability by enabling implementations by multiple vendors and on multiple platforms.

This Part of ISO/IEC 29500 specifies concepts for documents and applications of both strict and transitional conformance.

2. Conformance

2.1 Document Conformance

A document of conformance class Office Open XML Strict shall be a package of conformance class OPC, as specified in ISO/IEC 29500-2, for which all the following shall hold:

- The document obeys all constraints specified in this Part of ISO/IEC 29500
- The document is of category Wordprocessing, Spreadsheet, or Presentation, as defined in §4
- For each OPC Part of the document of the types listed in §11.3, §12.3, §13.3, §14.2 or §15.2, all the following shall hold:
 - i. The Part may contain markup in the Markup Compatibility namespace as specified in ISO/IEC 29500-3
 - ii. After the removal of any extensions by an MCE processor as specified in ISO/IEC 29500-3, the part is valid against the strict W3C XML Schema (Appendix A)

This Part of ISO/IEC 29500 uses the following further terms to refer to documents of conformance class Office Open XML Strict:

- *WML Strict*, if the document is of category Wordprocessing
- *SML Strict*, if the document is of category Spreadsheet
- *PML Strict*, if the document is of category Presentation

2.2 Application Conformance

Application conformance incorporates both syntax and semantics:

- A conforming consumer shall not reject any conforming documents of at least one document conformance class.
- A conforming producer shall be able to produce conforming documents of at least one document conformance class.
- A conforming application shall treat the information in Office Open XML documents in a manner consistent with the semantic definitions given in ISO/IEC 29500. An application's intended behavior need not require that application to process all of the information in an Office Open XML document. However, the information that it does process shall be processed in a manner that is consistent with the semantic definitions given in ISO/IEC 29500.

[Note: This note illustrates the third bullet above. Conforming applications might serve various functions. Examples include a viewer, an editor, and a back-end processor. Here is an illustration of how the third bullet applies to each of those examples:

- If a conforming viewer supports a given feature, then when it displays information using that feature, it respects the semantics of that feature as described in the Standard.

- If a conforming editor supports a given feature, then when it provides its user with an interface for manipulating information using that feature, it respects the semantics of that feature as described in the Standard.
- If a conforming back-end processor supports a given feature, then when that processor transforms or assembles information involving that feature, that processor respects the semantics of that feature as described in the Standard.

end note]

This Part of ISO/IEC 29500 defines the following application conformance classes:

- *WML Strict*, if the application is a conforming application that is a consumer or producer of documents having conformance class WML Strict.
- *SML Strict*, if the application is a conforming application that is a consumer or producer of documents having conformance class SML Strict.
- *PML Strict*, if the application is a conforming application that is a consumer or producer of documents having conformance class PML Strict.

Conformance can also involve the use of application descriptions; see §2.3 for details.

2.3 Application Descriptions

An application can be defined as conforming to zero or more *application descriptions* in a particular conformance class.

The application descriptions defined within ISO/IEC 29500 are:

- Base
- Full

[*Note:* These application descriptions should not be taken as limiting the ability of an application provider to create innovative applications. They are intended as a mechanism for labelling applications rather than for restricting their capabilities. The intention is to promote interoperability between different applications that share the same conformance class. Application descriptions are orthogonal to the conformance of the documents produced by those applications. For example, a tool used for automated translation of documents might have an application description of “Base” but will still produce fully conformant documents. *end note]*

The application descriptions are determined in terms of an application’s semantic understanding of particular features. *Semantic understanding* is to be interpreted in that an application shall treat the information in Office Open XML documents in a manner consistent with the semantic definitions given in ISO/IEC 29500.

Each application description is identified by a URI.

The application descriptions are defined in the following subclauses.

2.3.1 Base Application Description

Description URI: <http://purl.oclc.org/ooxml/descriptions/base>

An application conforming to this description has a semantic understanding of at least one feature within its conformance class.

[*Note*: In addition, applications that include a user interface are strongly recommended to support all accessibility features appropriate to that user interface. *end note*]

2.3.2 Full Application Description

Description URI: <http://purl.oclc.org/ooxml/descriptions/full>

An application conforming to this description has a semantic understanding of every feature within its conformance class.

2.3.3 Additional Application Descriptions

It is expected that additional application descriptions will be defined within the maintenance process for ISO/IEC 29500. It is also expected that third parties might define their own application descriptions; for example to inform their procurement decisions, or to deal with domains such as accessibility.

[*Note*: A possible application description would be a “standard” application description for a wordprocessing application. This could be created by taking the intersection of the features available in common wordprocessing applications such as Word 2000, OpenOffice 2, WordPerfect, and iWork Pages. In addition, it could define formats such as specific image and video formats required to be supported to conform to the description.

Similar descriptions could be created for spreadsheet applications and presentation applications. Such a description would promote interoperability between applications implementing OOXML. It would also promote interoperability between applications implementing OOXML and applications implementing other document formats such as ISO/IEC 26300. *end note*]

Application descriptions are not required to be strict subsets of each other. An application can simultaneously conform to multiple application descriptions.

Any such newly created description shall enumerate the features that are required for conformance to it. Such a description should provide a machine-processable schema, preferably using a standard such as ISO/IEC 19757.

[*Note*: If the application conforming to a description is a document consumer, it should be able to consume any document that respects such a schema associated with the description. If the application is a document producer, any document produced by that application should respect the schema of the description. *end note*]

Any such description should be identified using a URI, in a similar manner to the names used for application descriptions within ISO/IEC 29500.