

INTERNATIONAL STANDARDIZED PROFILE

**ISO/IEC
ISP
15124-1**

First edition
1998-07-01

Information technology — International Standardized Profile FOD126 — Open Document Format: Image Applications — Enhanced document structure — Character, raster graphics, and geometric graphics content architecture — Part 1: Document Application Profile (DAP)

*Technologies de l'information — Profil normalisé international FOD126 —
Format de document ouvert: Applications d'image — Structure de
document améliorée — Architecture du contenu des caractères, des
graphiques à raster et des graphiques géométriques —*

Partie 1: Profil d'application de document



Contents

1 SCOPE	1
2 NORMATIVE REFERENCES.....	1
2.1 IDENTICAL RECOMMENDATIONS INTERNATIONAL STANDARDS.....	2
2.2 PAIRED RECOMMENDATIONS INTERNATIONAL STANDARDS EQUIVALENT IN TECHNICAL CONTENT	2
2.3 ADDITIONAL REFERENCES.....	3
3 DEFINITIONS AND TERMINOLOGY.....	5
3.1 DEFINITIONS	5
3.2 CONSTITUENT NAMES	5
3.3 CONVENTIONS	5
4 RELATIONSHIP TO OTHER INTERNATIONAL STANDARDIZED PROFILES	6
5 CONFORMANCE	6
5.1 DATA STREAM CONFORMANCE	6
5.2 IMPLEMENTATION CONFORMANCE.....	7
6 CHARACTERISTICS SUPPORTED BY THIS PART OF ISO/IEC ISP 15124.....	7
6.1 OVERVIEW	7
6.2 LOGICAL CONSTITUENTS	8
6.3 LAYOUT CONSTITUENTS.....	8
6.3.1 <i>Overview of the layout characteristics</i>	9
6.3.2 <i>DocumentLayoutRoot</i>	9
6.3.3 <i>Page characteristics</i>	9
6.3.3.1 <i>CompositePage</i>	10
6.3.3.2 <i>Page dimensions</i>	10
6.3.3.3 <i>Nominal page sizes</i>	10
6.3.4 <i>OriginalImage</i>	10
6.3.5 <i>RevisionAnnotation</i>	10
6.3.6 <i>SpecificBlock</i>	11
6.3.7 <i>GenericBlock</i>	11
6.4 DOCUMENT LAYOUT CHARACTERISTICS.....	15
6.5 CONTENT LAYOUT AND IMAGING CONTROL	15
6.5.1 <i>Raster graphics content</i>	15
6.5.1.1 <i>Introduction</i>	15
6.5.1.2 <i>Raster graphics content architecture</i>	16
6.5.1.3 <i>Raster graphics encoding methods</i>	16
6.5.1.4 <i>Raster presentation</i>	17
6.5.2 <i>Character content</i>	17
6.5.2.1 <i>Character content architecture class</i>	17
6.5.2.2 <i>Character repertoires</i>	18
6.5.2.3 <i>Code extension techniques</i>	18
6.5.2.4 <i>Line spacing</i>	20
6.5.2.5 <i>Character spacing</i>	20
6.5.2.6 <i>Character path and line progression</i>	21
6.5.2.7 <i>Character orientation</i>	21

© ISO/IEC 1998

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

ISO/IEC Copyright Office • Case postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

6.5.2.8 <i>Emphasis</i>	21
6.5.2.9 <i>Tabulation</i>	22
6.5.2.10 <i>Alignment</i>	22
6.5.2.11 <i>Fonts</i>	22
6.5.2.12 <i>Reverse character strings</i>	23
6.5.2.13 <i>Superscripts and subscripts</i>	23
6.5.2.14 <i>Substitution of characters</i>	23
6.5.2.15 <i>Use of control functions</i>	24
6.5.3 <i>Geometric graphics content</i>	24
6.6 MISCELLANEOUS FEATURES.....	24
6.6.1 <i>Resource documents</i>	24
6.6.2 <i>Application comments</i>	25
6.7 DOCUMENT MANAGEMENT FEATURES.....	25
6.7.1 <i>Document constituent information</i>	25
6.7.2 <i>Document characteristics</i>	25
6.7.3 <i>Non-basic document characteristics</i>	26
6.7.3.1 <i>Profile character sets</i>	26
6.7.4 <i>Document management attributes</i>	27
7 SPECIFICATION OF CONSTITUENT CONSTRAINTS	28
7.1 NOTATION.....	28
7.2 DOCUMENT PROFILE CONSTITUENT CONSTRAINTS.....	29
7.2.1 <i>Macro definitions</i>	29
7.2.2 <i>Constituent constraints</i>	35
7.2.2.1 <i>DocumentProfile</i>	35
7.3 LOGICAL CONSTITUENT CONSTRAINTS.....	38
7.4 LAYOUT CONSTITUENT CONSTRAINTS.....	38
7.4.1 <i>Macro definitions</i>	38
7.4.2 <i>Factor constraints</i>	38
7.4.3 <i>Constituent constraints</i>	39
7.4.3.1 <i>DocumentLayoutRoot</i>	39
7.4.3.2 <i>CompositePage</i>	39
7.4.3.3 <i>OriginalImage</i>	40
7.4.3.4 <i>RevisionAnnotation</i>	40
7.4.3.5 <i>SpecificBlock</i>	41
7.4.3.6 <i>GenericBlock</i>	42
7.5 LAYOUT STYLE CONSTRAINTS.....	43
7.6 PRESENTATION STYLE CONSTRAINTS.....	43
7.6.1 <i>Macro definitions</i>	43
7.6.2 <i>Factor constraints</i>	43
7.6.3 <i>Presentation style constituent constraint</i>	43
7.6.3.1 <i>PStyle1</i>	43
7.6.3.2 <i>PStyle2</i>	44
7.6.3.3 <i>PStyle3</i>	44
7.7 CONTENT PORTION CONSTRAINTS.....	44
7.7.1 <i>Macro definitions</i>	44
7.7.2 <i>Factor constraints</i>	45
7.7.3 <i>Constituent constraints</i>	45
7.7.3.1 <i>Character content portion</i>	45
7.7.3.2 <i>Raster graphics content portion</i>	45
7.7.3.3 <i>Geometric graphics content portion</i>	46
7.8 ADDITIONAL USAGE CONSTRAINTS.....	47
8 INTERCHANGE FORMAT	47
8.1 INTERCHANGE FORMAT ODIF (CLASS A).....	47
8.1.1 <i>Interchange format</i>	47
8.1.2 <i>DAP identifier</i>	47
8.1.3 <i>Encoding of application comments</i>	47
8.2 INTERCHANGE FORMAT SDIF.....	48
8.2.1 <i>Interchange format</i>	48
8.2.2 <i>DAP identifier</i>	48

8.2.3 Encoding of application comments.....	48
8.3 ENCODING OF RASTER CONTENT INFORMATION	48
ANNEX A (NORMATIVE) AMENDMENTS AND CORRIGENDA.....	50
A.1 AMENDMENTS.....	50
A.1.1 Amendments to the base standard	50
A.2 CORRIGENDA	50
A.2.1 Corrigenda to this part of ISO/IEC ISP 15124	50
ANNEX B (INFORMATIVE) RECOMMENDED PRACTICES	51
B.1 TRANSFER METHODS FOR ODA	51
B.1.1 Conveyance of ODA over ITU X.400-1984	51
B.1.2 Conveyance of ODA over FTAM.....	51
B.1.3 Conveyance of ODA over DTAM	52
B.1.4 Conveyance of ODA over flexible disks.....	52
B.2 FONT REFERENCE	52
B.3 ISO/IEC 8632 (CGM) CONSTRAINTS FOR THIS INTERNATIONAL STANDARDIZED PROFILE	53
B.3.1 Delimiter elements	54
B.3.2 Metafile descriptor elements.....	54
B.3.3 Picture descriptor elements	54
B.3.4 Control elements.....	54
B.3.5 Graphical primitive elements	54
B.3.6 Attribute elements	55
B.3.7 External elements	56
B.4 INTEROPERABILITY WITH SGML APPLICATIONS.....	57
ANNEX C (INFORMATIVE) REFERENCES TO OTHER STANDARDS AND REGISTERS.....	58

List of figures

Figure 1 - Constituents	8
Figure 2 - Document layout structure	9
Figure 3 - Code extension features (basic case)	19
Figure 4 - Code extension features (all possible cases)	20

List of tables

Table 1 - Dimensions for various page sizes	12
Table 2 - Layout attributes	12
Table 3 - Content coding attributes	13
Table 4 - Presentation attributes	13
Table 5 - Document profile attributes	14
Table 6 - Symbols to denote shift functions	28

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. In addition to developing International Standards, ISO/IEC JTC 1 has created a Special Group on Functional Standardization for the elaboration of International Standardized Profiles.

An International Standardized Profile is an internationally agreed, harmonized document which identifies a standard or group of standards, together with options and parameters, necessary to accomplish a function or set of functions.

Draft International Standardized Profiles are circulated to national bodies for voting. Publication as an International Standardized Profile requires approval by at least 75 % of the national bodies casting a vote.

International Standardized Profile ISO/IEC ISP 15124-1 was prepared with the collaboration of

- Asia-Oceania Workshop (AOW);
- European Workshop for Open Systems (EWOS);
- Open Systems Environment Implementors' Workshop (OIW).

ISO/IEC ISP 15124 consists of the following part, under the general title *Information technology - International Standardized Profile FOD126 - Open Document Format: Image Applications - Enhanced document structure - Character, raster graphics, and geometric graphics content architecture*:

- *Part 1: Document Application Profile (DAP)*

Further parts may be added.

Annex A forms an integral part of this part of ISO/IEC 15124. Annexes B and C are for information only.

Introduction

This part of ISO/IEC ISP 15124 is defined within the context of Functional Standardization, in accordance with the principles specified by ISO/IEC TR 10000, "Framework and Taxonomy of International Standardized Profiles". The context of Functional Standardization is one part of the overall field of Information Technology (IT) standardization activities, covering base standards, profiles and registration mechanisms. An International Standardized Profile defines a combination of base standards that collectively perform a specific well-defined IT function. Profiles standardize the use of options and other variations in the base standards, and provide a basis for the development of uniform, internationally recognized conformance test suites.

One of the most important roles for an ISP is to serve for the development (by organizations other than ISO and IEC) of internationally recognized tests and test centres. ISPs are produced not simply to "legitimize" a particular choice of base standards and options, but to promote real systems interoperability. The development and widespread acceptance of tests based on this and other ISPs is crucial to the successful realization of this goal.

Development of this document application profile has been done in close cooperation between several organizations. These include ODA expert groups within the Asia-Oceania Workshop (AOW), ITU-T Study Group 8, European Workshop for Open Systems (EWOS) and OSE Implementors' Workshop (OIW). The liaison between these organizations has occurred within meetings of the Profile Alignment Group for ODA (PAGODA). These meetings have focused on the development of a single set of Internationally aligned ODA document application profiles. This part of ISO/IEC ISP 15124 is harmonized among the three workshops and has been ratified by the three workshops' plenary assemblies.

The purpose of ISO/IEC ISP 15124 is to facilitate the interworking of basic image applications interchanging documents based on ITU-T Rec. T.410 series | ISO/IEC 8613, Open Document Architecture (ODA) and Interchange Format. This part of ISO/IEC ISP 15124 is suitable for interchanging documents in formatted form and has been defined in accordance with ITU-T Rec. T.411 | ISO/IEC 8613-1. The documents contain primarily raster graphics images but may also contain character and geometric graphics portions. The format of this part of ISO/IEC ISP 15124 is in accordance with ISO/IEC TR 10000-1 and with the standardized proforma and notation defined in Annex F of ITU-T Rec. T.411 | ISO/IEC 8613-1.

**Information technology — International Standardized Profile FOD126 —
Open Document Format: Image Applications —
Enhanced document structure — Character, raster graphics, and geometric graphics
content architecture —**

Part 1:

Document Application Profile (DAP)

1 Scope

This part of ISO/IEC ISP 15124 specifies an interchange format suitable for transfer of structured documents between equipment designed for raster processing. The documents supported by ISO/IEC ISP 15124 are based on a paradigm of an electronic engineering drawing or illustration. Such documents contain one or more pages. Each page consists of a base image in the form of a bi-tonal raster graphics, character, or geometric graphics content. This base image may be further annotated with character, raster graphics or geometric graphics content. These latter content portions serve to provide revision control for the engineering drawing or illustration. There is no restriction on the minimum size of the base image.

ISO/IEC ISP 15124 allows large format raster documents to be interchanged in a formatted form in accordance with ISO/IEC 8613.

It is assumed that, when negotiation is performed by the service using this part of ISO/IEC ISP 15124, all non-basic values are subject to negotiation.

This part of ISO/IEC ISP 15124 is independent of the processes carried out in an end system to create, edit, or reproduce raster documents. It is also independent of the means to transfer the document which, for example, may be by means of communication links or exchanged storage media.

The features of a document that can be interchanged using this part of ISO/IEC ISP 15124 fall into the following categories:

- a) Page format features - these concern how the layout of each page of a document will appear when reproduced;
- b) Raster graphics layout and imaging features - these concern how the document content will appear within pages of the reproduced document;
- c) Raster graphics coding - these concern the raster graphics representations and control functions that make up the document raster graphics content.

There are two DAP object identifiers supporting this part of ISO/IEC ISP 15124 with the only difference being in the encoding of the data stream. One uses the ASN.1 based ODIF encoding. The other uses the SGML/SDIF based ODL encoding. When this document refers to this profile, it is referring to this specification regardless of which DAP identifier may be selected to create the data stream.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC ISP 15124. At the time of publication, the editions indicated were valid. All documents are

subject to revision, and parties to agreements based on this part of ISO/IEC ISP 15124 are warned against automatically applying any more recent editions of the documents listed below, since the nature of references made by ISPs to such documents is that they may be specific to a particular edition. members of IEC and ISO maintain registers of currently valid International Standards and ISPs, ITU-T maintains published editions of its current Recommendations.

2.1 Identical Recommendations / International Standards

- ITU-T Recommendations T.411 (1993) | ISO/IEC 8613-1 : 1994, *Information technology - Open Document Architecture (ODA) and interchange format : Introduction and general principles.*
- ITU-T Recommendations T.412 (1993) | ISO/IEC 8613-2 : 1994, *Information technology - Open Document Architecture (ODA) and interchange format : Document structures.*
- ITU-T Recommendations T.414 (1993) | ISO/IEC 8613-4 : 1994, *Information technology - Open Document Architecture (ODA) and interchange format : Document profile.*
- ITU-T Recommendations T.415 (1993) | ISO/IEC 8613-5 : 1994, *Information technology - Open Document Architecture (ODA) and interchange format : Open document interchange format.*
- ITU-T Recommendations T.416 (1993) | ISO/IEC 8613-6 : 1994, *Information technology - Open Document Architecture (ODA) and interchange format : Character content architectures.*
- ITU-T Recommendations T.417 (1993) | ISO/IEC 8613-7 : 1994, *Information technology - Open Document Architecture (ODA) and interchange format : Raster graphics content architectures.*
- ITU-T Recommendations T.418 (1993) | ISO/IEC 8613-8 : 1994, *Information technology - Open Document Architecture (ODA) and interchange format : Geometric graphics content architectures.*

2.2 Paired Recommendations/International Standards equivalent in technical content

- CCITT Rec. X.208 (1988), *Specification of Abstract Syntax Notation One (ASN.1).*
ISO/IEC 8824 : 1990, *Information technology - Open Systems Interconnection - Specification of Abstract Syntax Notation One (ASN.1).*
- CCITT Rec. X.209 (1988), *Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1).*
ISO/IEC 8825 : 1990, *Information technology - Open Systems Interconnection - Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1).*
- CCITT Rec. T.502, *Document Application Profile PM-11 for the Interchange of Character Content Documents in Processable and Formatted Forms.*
ISO/IEC ISP 10610-1: 1993, *Information technology - International Standardized Profile FOD11 - Open Document Format: Simple document structure - Character content architecture only - Part 1: Document Application Profile (DAP).*

- CCITT Rec. T.505, *Document Application Profile PM-26 for the Interchange of Mixed Content Documents in Processable and Formatted Forms*.

ISO/IEC ISP 11181-1: 1993, *Information technology - International Standardized Profile FOD26 - Open Document Format: Enhanced document structure - Character, raster graphics and geometric graphics content architectures - Part 1: Document Application Profile (DAP)*.
- CCITT Rec. T.506, *Document Application Profile PM-36/ISO/IEC ISP 11182-1 - Open Document Format: Extended document structure - Character, raster graphics and geometric graphics content architectures*.

ISO/IEC ISP 11182-1: 1993, *Information technology - International Standardized Profile FOD36 - Open Document Format: Extended document structure - Character, raster graphics and geometric graphics content architectures - Part 1: Document Application Profile (DAP)*.

2.3 Additional references

- CCITT Rec. T.4 (1988), *Standardization of Group 3 Facsimile Apparatus for Document Transmission*.
- CCITT Rec. T.6 (1988), *Facsimile Coding Schemes and Coding Control Functions for Group 4 Facsimile Apparatus*.
- CCITT Rec. T.400 (1988), *Introduction to Document Architecture, Transfer and manipulation*.
- ISO/IEC 646 : 1991, *Information technology - ISO 7-bit coded character set for information interchange*.
- ISO/IEC 2022 : 1994, *Information technology - Character code structure and extension techniques*.
- ISO 2375 : 1985, *Data processing - Procedure for registration of escape sequences techniques*.
- ISO/IEC 6937 : 1994, *Information technology - Coded graphic character set for text communication - Latin alphabet*.

ISO 7350 : 1991, *Information technology - Registration of repertoires of graphic characters from ISO/IEC 10367*.
- ISO/IEC 8632-1 : 1992, *Information technology - Computer graphics - Metafile for the storage and transfer of picture description information - Part 1: Functional specification*.
- ISO/IEC 8632-3 : 1992, *Information technology - Computer graphics - Metafile for the storage and transfer of picture description information - Part 3: Binary encoding*.
- ISO 8859-1 : 1987, *Information processing - 8-bit single-byte coded graphic character sets - Part 1: Latin alphabet No. 1*.
- ISO 8879 : 1986, *Information processing - Text and office systems - Standard Generalized Markup Language (SGML)*.

- ISO 8879 : 1986 / Amd.1 : 1988, *Information processing - Text and office systems - Standard Generalized Markup Language (SGML), Amendment 1.*
- ISO 9069 : 1988, *Information processing - SGML support facilities - SGML Document Interchange Format (SDIF).*
- ISO/IEC 9293 : 1994, *Information technology - Volume and file structure of disk cartridges for information interchange.*
- ISO/IEC 9541 (all parts), *Information technology - Font information interchange.*
- ISO/IEC TR 10000-1 : 1995, *Information technology - Framework and taxonomy of International Standardized Profiles - Part 1: General principles and documentation framework.*
- ISO/IEC TR 10000-2 : 1995, *Information technology - Framework and taxonomy of International Standardized Profiles - Part 2: Principles and Taxonomy of ISO profiles.*
- ISO/IEC ISP 12064-1: 1995, *Information technology - International Standardized Profile FOD112 - Open Document Format: Image Applications - Simple Document Structure -Raster Graphics content architecture - Part 1: Document Application Profile (DAP).*

3 Definitions and terminology

3.1 Definitions

The definitions given in ISO/IEC 8613-1 are applicable to this part of ISO/IEC ISP 15124.

3.2 Constituent names

Each constituent that may be included in a document that conforms to this part of ISO/IEC ISP 15124 has been given a unique name which serves to identify that constituent throughout ISO/IEC ISP 15124.

The convention is that full names are used (i.e., no abbreviations are used), two or more words in a name are concatenated and each word begins with a capital. Examples of constituent names used in ISO/IEC ISP 15124 are CompositePage, DocumentLayoutRoot, and SpecificBlock.

In clause 6, each constituent provided by this part of ISO/IEC ISP 15124 is underlined once at the point in the text at which the purpose of that constituent is defined. This also serves to identify all the constituents provided by this part of ISO/IEC ISP 15124.

The same constituent names are also used in the technical specification in clause 7 so that there is a one-to-one correspondence between the use of these names in clauses 6 and 7.

Although the constituent names relate to the purpose of the constituents, the semantics of constituents shall not be implied from the actual names that are used. Also, these names do not appear in an interchanged document but a mechanism for identifying constituents in an interchange document is provided. Thus in an application using this part of ISO/IEC ISP 15124, the constituents may be known to the user by different names (e.g. in different languages).

3.3 Conventions

This part uses a convention of double and single quotes that has been established by ISO for use in the ODA base standard and related document application profiles. The convention is to use within the text double quotes to accentuate ODA attribute names and single quotes to accentuate values for those attributes.

4 Relationship to other International Standardized Profiles

The raster graphics content portion of this part of ISO/IEC ISP 15124 closely aligns with ISO/IEC ISP 11182-1. The primary exception is that ISO/IEC ISP 15124 supports tiled raster graphics and the additional bit order mapping.

The features supported by ISO/IEC ISP 15124 are a superset of the features supported by the International Standardized Profile FOD112 and thus all data streams that are conformant to FOD112 are also conformant to ISO/IEC ISP 15124, apart from the document application profile identifier.

Apart from the use of the tiling addendum and the use of Most Significant Bit encoding the features supported by this part of ISO/IEC ISP 15124 are a subset of the features supported by the International Standardized Profile ISO/IEC ISP 11182-1 and thus all data streams conformant to this part of ISO/IEC ISP 15124 are also conformant to ISO/IEC ISP 11182-1, apart from the document application profile identifier.

5 Conformance

In order to conform to ISO/IEC ISP 15124, a data stream representing a document shall meet the requirements specified in 5.1.

The requirements for implementations that originate and/or receive data streams conforming to ISO/IEC ISP 15124 are specified in 5.2.

5.1 Data stream conformance

The following requirements apply to the encoding of data streams that conform to ISO/IEC ISP 15124:

- a) The data stream shall be encoded in accordance with the ASN.1 encoding rules defined in ISO/IEC 8825 or the SGML grammar and syntax of ISO 8879;
- b) The data stream shall be structured in accordance with the interchange format defined in clause 8;
- c) The document shall be structured in accordance with the formatted document architecture class specified in clause 7. In addition, the document shall contain all mandatory constituents specified for that class and may optionally contain constituents permitted for that class as specified in clause 7;
- d) Each constituent shall contain all those attributes specified as required for that constituent in this part of ISO/IEC ISP 15124. Other attributes may be specified provided they are permitted for that constituent;
- e) The attributes shall have values within the range of permissible values specified in this part of ISO/IEC ISP 15124;
- f) The encoded document shall be structured in accordance with the abstract document architecture defined in ITU-T Rec. T.412 | ISO/IEC 8613-2;
- g) The encoded document shall be structured in accordance with the characteristics defined in clause 6 and shall contain only those features defined in clause 6.

5.2 Implementation conformance

This clause states the requirements for implementations claiming conformance to ISO/IEC ISP 15124.

A conforming receiving implementation shall be capable of receiving *either* any data streams conforming to this part of ISO/IEC ISP 15124 structured in accordance with ODIF *or* any data streams conforming to this part of ISO/IEC ISP 15124 structured in accordance with ODL *or* both of these. Receiving usually, but not always, involves recognizing and further processing the data stream elements.

6 Characteristics supported by this part of ISO/IEC ISP 15124

This clause describes the characteristics of documents that can be represented by data streams conforming to this part of ISO/IEC ISP 15124. This clause also describes how these characteristics are represented in terms of divisional components of the data streams.

6.1 Overview

This part of ISO/IEC ISP 15124 describes the features of ITU-T Rec. T.400 series | ISO/IEC 8613 that are needed to support the interchange of documents containing raster graphic images. It specifies interchange formats for the transfer of structured documents with simple layout structures.

This part of ISO/IEC ISP 15124 describes documents that can be interchanged in the formatted form, which facilitates the reproduction of a document as intended by the originator.

The content within the document forming the original or base image(s) is of content type formatted processable raster graphics.

The content allowed within the document to annotate revisions to the base image(s) may also be formatted processable raster graphics, or may be formatted processable geometric graphics, and/or formatted character. This is intended to facilitate the reproduction of the corrections or annotations as intended by the originator or allow the reformatting of the corrections or annotations.

This clause describes the layout features that can be represented in documents conforming to this part of ISO/IEC ISP 15124. The features are described in terms that are typical of the user-perceived capabilities and semantics found in a raster document interchange environment.

For the purpose of interchange, a document is represented as a collection of **constituents**, each of which is represented by a set of attributes. The constituents that make up a formatted document are defined below in this clause and are illustrated in figure 1.

Document Profile
Generic Layout Structure (Optional)
Presentation Style (s) (Optional)
Specific Layout Structure
Content Portion Description (s)

Figure 1 - Constituents

Constituents defined as **required** shall occur in any document that conforms to ISO/IEC ISP 15124. Constituents listed as **optional** may or may not be present in the document, depending on the requirements of the particular document.

The required constituents include:

- a) a document profile;
- b) layout object descriptions representing a specific layout structure;
- c) content portion descriptions.

The only optional constituents are presentation style and layout object class descriptions representing a generic layout structure.

6.2 Logical constituents

Not applicable.

6.3 Layout constituents

This clause describes the features of the layout constituents that can be represented in documents conforming to ISO/IEC ISP 15124.

6.3.1 Overview of the layout characteristics

The document structure allows the document content to be laid out and presented in one or more pages. Each page in a document may consist of a single raster graphics image. This would be the case for an original image of an engineering drawing, illustration, or other raster scanned image. Optionally, each page in a document may consist of an original raster graphics image with additional character, raster graphics or geometric graphics content, representing a set of revision annotations of the original image.

A specific layout structure of the document conforming to this application profile consists of a four-level hierarchy consisting of a document layout root, composite pages, frames, and blocks. The document can consist of multiple composite pages where each page represents a single image including any revision or annotations. The composite pages consist of frames which in turn contain blocks containing the content associated with the base image and the revisions or annotations.

Figure 2 is an illustration of the features of the document layout structure supported by ISO/IEC ISP 15124.

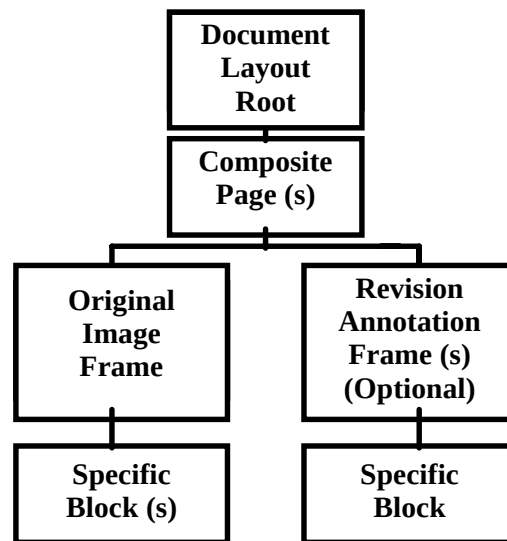


Figure 2 - Document layout structure

6.3.2 DocumentLayoutRoot

A DocumentLayoutRoot is the top level in a document layout structure. Its immediate subordinates consists of a sequence of one or more constituents of type CompositePage.

6.3.3 Page characteristics

A document consists of a sequence of one or more composite pages. In each composite page, two types of frames may be used to position content information on the page. One frame type is used to position the content representing the original image on the page. Only one frame of this type is allowed per page, but it may contain any number of blocks containing raster graphics content portions. The second frame type is used to position blocks containing character, raster graphics or geometric graphics content representing a revision annotation on the page. There may be one or more of the frames containing a revision annotation.

A document may consist of multiple pages of different sizes. Each page may be either landscape or portrait orientation. Both orientations are permitted in the same document.

6.3.3.1 CompositePage

A CompositePage is a constituent constraint which defines a composite-page that corresponds to the page area used for presenting the sequence of an OriginalImage frame and zero or more RevisionAnnotation frames.

6.3.3.2 Page dimensions

A wide variety of page dimensions are supported including large format raster documents. The dimensions of the pages may be specified as any value, in BMU measurement units, including the larger sizes produced from foldout-size images and roll paper. These sizes apply to both portrait and landscape orientations. The page sizes include: ISO A0-A5, ANSI A-K, Japanese legal and letter, foldouts 27.94 cm (11 in.) X 34.56 cm (14 in.) and 27.94 cm (11 in.) X 43.18 cm (17 in.), and 27.94 cm (11 in.) roll paper.

Dimensions equivalent to or less than the common assured reproduction area (CARA) of ISO A4 and North American Letter (ANSI-A) in portrait or landscape orientation are basic values. Larger page sizes including those produced from roll paper are non-basic and their use shall be indicated in the document profile by using the "page dimensions" attribute (See table 2).

The default dimensions of the layout object page are the CARA of ISO A4 and North American Letter (ANSI-A). The "page position" attribute may be used to specify the position of the layout object page on the nominal page. Although actual page dimensions may be used allowing for the layout object page to completely fill a nominal page leaving no borders, it is advised that the assured reproduction area (ARA) listed in table 1 be used whenever feasible. Any value of the attribute "page position" may be specified as the default value in the document profile.

See 7.3 of ITU-T Rec. T.412 | ISO/IEC 8613-2 for general rules for positioning pages on presentation surfaces.

6.3.3.3 Nominal page sizes

The nominal page sizes that may be specified are listed in table 1. In addition, 11 inch roll paper of any length is supported. These may be specified in portrait or landscape orientations. All values of nominal page size are non-basic and hence all values used in a document shall be indicated in the document profile using the "medium type" attribute (See table 2).

Any of the nominal page sizes defined in table 1, subject to the restriction specified above, may be specified as the default value in the document profile.

Table 1 also includes the recommended ARA. Information loss may occur when a document is reproduced if the dimensions of the CompositePage exceed the ARA for the specified nominal page size.

6.3.4 OriginalImage

An OriginalImage is a constituent constraint which defines a lowest level frame used for laying out the original image of an engineering drawing, illustration or other image. This frame contains one or more SpecificBlocks each of which may contain one raster graphics content portion. There shall be exactly one OriginalImage frame on each page.

This type of frame has a fixed position and dimensions. The position, if not specified, defaults to the origin of the page. The dimensions, if not specified, default to the maximum size that can be achieved for the position within the area of the page.

6.3.5 RevisionAnnotation

A RevisionAnnotation is a constituent constraint which defines the lowest level frame used for laying out a revision annotation associated with the original image. This frame contains one or more SpecificBlocks, each

containing either a character content portion, a raster graphics content portion or a geometric graphics content portion.

This type of frame has a fixed position and dimensions. This provision provides for the capability of positioning of revision annotation anywhere on the page. Registration of revision annotation over a portion of the original image, as in revision artwork, is accomplished using this capability.

6.3.6 SpecificBlock

A SpecificBlock is a constituent constraint which defines a basic layout object used to position and image the content portions associated with either an OriginalImage or RevisionAnnotation frame.

The position of the block is fixed and defaults to the origin of the superior frame. The dimensions default to the maximum size that can be achieved for the position within the area of the superior frame.

6.3.7 GenericBlock

GenericBlock is a constituent constraint which defines a layout object class which can define content that is common and can be referenced throughout the document. Any content type (raster, character, or geometric graphics) can be defined using this technique.

Table 1 - Dimensions for various page sizes

Page type	Size	Size (BMU)	ARA (BMU)
- Metric			
ISO-A5	148mm x 210mm	7015 x 9920	6600 x 9240
ISO-A4	210mm x 297mm	9920 x 14030	9240 x 13200
ISO-A3	297mm x 420mm	14030 x 19840	13200 x 18480
ISO-A2	420mm x 594mm	19840 x 28060	18898 x 27118
ISO-A1	594mm x 841mm	28060 x 39680	26173 x 37843
ISO-A0	841mm x 1189mm	39680 x 56120	378 x 54283
- ANSI			
ANSI-A	8.5in x 11in	10200 x 13200	9240 x 12400
ANSI-B	11in x 17in	13200 x 20400	12744 x 19656
ANSI-C	17in x 22in	20400 x 26400	19500 x 25800
ANSI-D	22in x 34in	26400 x 40800	25800 x 39600
ANSI-E	34in x 44in	40800 x 52800	39600 x 52200
ANSI-F	28in x 40in	33600 x 48000	32400 x 47400
ANSI-G	11in x 90in	13200 x 108000	12400 x 106800
ANSI-H	28in x 143in	33600 x 171600	31400 x 170400
ANSI-I	34in x 176in	40800 x 211200	39600 x 210000
ANSI-J	40in x 143in	48000 x 171600	47400 x 170400
ANSI-K	8.5in x 14in	10200 x 16800	9240 x 15480
- Foldouts			
Small	11in x 14in	13200 x 16800	12744 x 15480
Small-open	11in x open	13200 x open	12744 x open
- Japan			
Legal	257mm x 364mm	12141 x 17196	11200 x 15300
Letters	182mm x 257mm	8598 x 12141	7600 x 10200

Tutorial Note - These page sizes are for the portrait orientation.

Table 2 - Layout attributes

Attributes	Basic values	Permissible default values	Non-basic values
Page dimensions **	CARA ISO A4 and ANSI-A	CARA ISO A4 and ANSI-A	ARA ISO A0-A3, ANSI B-K, Japan legal, 11" Roll Paper
Medium-type ** (Nominal page size)	None	ISO A0-A5, ANSI A-K, Japan letter & legal, 11" Roll Paper	ISO A0-A5, ANSI A-K, Japan letter & legal, 11" Roll Paper

Tutorial Note - See table 1 **

Table 3 - Content coding attributes

Attributes	Basic values	Permissible default values *	Non-basic values
Number-of-pels-per-line	any positive integer	None	None
Number-of-lines	any positive integer	any value	None
Compression	compressed	any value	uncompressed
Number-of-pels-per-tile-line	512	any value	Any non-negative integer except 512
Number-of-pels-per-line	512	any value	Any non-negative integer except 512
Tiling-offset **	(any non-negative integer < number-of-pels-per-tile-line, any non-negative integer < number-of-lines-per-tile)	None	None
Tile-types **	T.6 encoded, bitmap encoded, null background, null foreground, T.6 encoded - MSB	None	None
Type-of-coding	T.6 encoding (untiled), bitmap (untiled), tiled encoded, T.4 1D encoding, T.4 2D encoding, T.6 encoding - MSB (untiled), T.4 1D encoding - MSB, T.4 2D encoding - MSB	T.6 encoding, T.6 encoding - MSB, tiled encoding	None

Tutorial Note - * These are permissible default values which may be specified in the document profile. If no values are specified in the document profile, then the default values stipulated in the base standard are to be used.

Tutorial Note - ** Attribute only used if "type of coding" is 'tiled encoded'

Table 4 - Presentation attributes

Attributes	Basic values	Permissible default values	Non-basic values
Pel-path	d0, d90	any value	d180, d270
Line-progression	d270	any value	d90
Pel-spacing	16, 12, 8, 6, 5, 4, 3, 2, 1 BMU	any value except 'null'	Any value except 'null', and 16, 12, 8, 6, 5, 4, 3, 2, 1 BMU
Spacing-ratio	1	any value	any value except 1
Clipping	Two Coordinate Pairs (any non-negative integer, any non-negative integer)	None	None

Table 5 - Document profile attributes

Attribute	Class	Permissible values
Specific-layout-structure	m	present
Presentation-styles	nm	present
Document-characteristic	M	
Document-architecture-class	m	formatted
Document-application-profile	m	{-- See clause 8 for a definition of the permitted values for this attribute. --}
Content-architecture-classes	m	{2 8 2 7 2}
Interchange-format-class	m	A
ODA-version	m	ISO/IEC 8613, 1994-12-15
Document-architecture-defaults	M	
Content-architecture-class	m	formatted processable raster graphics
Type-of-coding	m	T.6 encoding, tiled encoding, T.6 encoding - MSB
Page-dimensions	nm	See list in table 1, (Default value is 9240 x 12400 BMU)
Medium-types	nm	See list in table 1
Page-position	nm	any coordinate pair within page
Raster-gr-content-defaults	NM	
Pel-path	nm	0, 90, 180, 270 degrees (0 is normal default)
Line-progression	nm	90, 270 degrees (270 is normal default)
Pel-spacing	nm	16, 12, 8, 6, 5, 4, 3, 2, 1 BMU, (Normal default is 4 BMU)
Spacing-ratio	nm	Any value
Non-basic-doc-characteristics	NM	
Profile-character-sets	nm	See 6.7.3.1
Page-dimensions	nm	See table 1
Medium-types	nm	See table 1
Coding-attributes	NM	
Compression	nm	uncompressed
Number-of-lines-per-tile-line	nm	any value except 512
Number-of-lines-per-tile	nm	any value except 512
Raster-gr-presentation-features	NM	
Pel-path	nm	180, 270 degrees
Line-progression	nm	90 degrees
Pel-spacing	nm	Any value except 16, 12, 8, 6, 5, 4, 3, 2 or 1 BMU
Document-management-attributes *	M	
Document-Reference	m	Any string of characters

The following notation is used in the class column of this table:

m mandatory attribute

nm non-mandatory attribute

d defaultable attribute

Capital letters (M, NM, and D) are used for groups of attributes.

Tutorial Note - * There are numerous other attributes (too many to list) that may optionally be used (nm).