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SWEDISH STANDARDS INSTITUTE

Grafisk teknik – Överföringsformat för färgdata och processtyrningsdata med användning av XML eller ASCII-text (ISO 28178:2009, IDT)

Graphic technology – Exchange format for colour and process control data using XML or ASCII text (ISO 28178:2009, IDT)

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Den internationella standarden ISO 28178:2009 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av ISO 28178:2009.

The International Standard ISO 28178:2009 has the status of a Swedish Standard. This document contains the official English version of ISO 28178:2009.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Grafisk teknik, SIS/TK 434.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

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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.

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

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member 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 shall not be held responsible for identifying any or all such patent rights.

ISO 28178 was prepared by Technical Committee ISO/TC 130, *Graphic technology*, and is based on ANSI CGATS 17:2005.

Introduction

A number of International Standards used by the graphic technology community require the reporting of measured and/or computed data. Several of these standards, e.g. the ISO 12642 series and ISO 13655, contain suggested formats for the data to be exchanged. These have used the ASCII keyword-value pair approach and have been widely used by some industry segments. However, there has never been a consolidated definition of the various formats.

This International Standard is intended to support all existing and future graphic arts standards that require the exchange of measured, computed, or process control data and the associated metadata necessary for its proper interpretation. It is specifically not intended for graphic arts content data, which are covered by ISO 15930 and ISO 12639.

In reviewing the needs of such a format the following requirements were identified:

— applications based on the existing ASCII formats not be made obsolete;

— data need to be in a form that is both human-readable (once the digital file has been displayed using standard editors, or file readers) and machine-readable;

— data need to be readable by automated programs to extract the necessary information;

— data files need to be extensible by end users in such a way as to allow additional information to be included without breaking automated readers of the file;

— data files need to be capable of being created by automated programs;

— the format needs to allow multiple language representation of data.

The file formats chosen to accomplish this task are a combination of XML and extensions of the existing ASCII keyword-value file format, coupled with the necessary tools to allow appropriate conversions to and from XML from ASCII keyword-value files. However, either the XML file format or the ASCII keyword-value file format can be used independently. Annex E shows the AMPAC (see ISO/TR 16044) coding for each of the ASCII keywords.

These formats make use of predefined XML tags and ASCII keywords. Values are associated with the tags and keywords and remain in effect until another instance of the tag or keyword. Provision is made to allow the use of data tables and to separately define the format within data tables. Multiple occurrences of such data tables within a single file are also permitted. User-defined tags and keywords are also allowed.

See Annex A for a discussion of the advantages of an XML data reporting format and references to a demonstration suite.

A demonstration suite based on this International Standard has been made available for use as part of a testing and development program. It is available from NPES The Association for Suppliers of Printing, Publishing and Converting Technologies, at http://www.npes.org/standards/tools.html. See A.5 for more information.

Subsequent to the final approval of this International Standard, ISO/TC 130 decided that additional verification of the XML implementation was desirable and an editing committee was formed to address this issue. The editing committee reported that the vendor of a commercial XML data exchange application had success in mapping both the ASCII and XML portions of this International Standard into their application. This was felt to provide a verification of the XML implementation proposed in this International Standard.

Graphic technology — Exchange format for colour and process control data using XML or ASCII text

1 Scope

This International Standard defines an exchange format for colour and process control data (and the associated metadata necessary for its proper interpretation) in electronic form using either XML or ASCII formatted data files. It maintains human readability of the data as well as enabling machine readability. It includes a series of predefined tags and keywords, and provides extensibility through provision for the dynamic definition of additional tags and keywords as necessary. It is focused primarily on spectral measurement data, colorimetric data, and densitometric data.

This International Standard is intended to be used in conjunction with other standards that will define the required data, and tags or keywords for specific data exchange applications.

2 Normative references

The following referenced documents are indispensable for the application 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/IEC 646, *Information technology — ISO 7-bit coded character set for information interchange*

Extensible Markup Language (XML) 1.0 (2nd ed.), World Wide Web Consortium (W3C), W3C Recommendation 6 October 2000. Available at http://www.w3.org

XSL Transformations (XSLT) Version 1.0, World Wide Web Consortium (W3C), W3C Recommendation 16 November 1999. Available at http://www.w3.org

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
data format identifier
predefined set of characters, without intervening spaces, forming a unique word that is used to identify the presence of a defined item of data in a subsequent data table

3.2
keyword
predefined set of characters, without intervening spaces, forming a unique word that is used to identify the presence of a defined item of information

3.3
schema
XML document that, following the rules established by the World Wide Web Consortium, defines the structure of a class of XML documents

3.4
value
information immediately following a keyword that represents the data content or “value” associated with that keyword

4 Requirements

4.1 General description of a conforming file

4.1.1 XML format

This file format is an XML format that complies with Extensible Markup Language (XML) 1.0. The format makes use of predefined tags that identify information commonly used to describe graphic arts samples. In addition, users of this format are allowed to define tags to tailor the format to their specific needs according to the rules of XML namespace.

The data file is divided into two sections. The preamble is the first section. This section provides general information and describes the conditions under which data was collected. The preamble tag is iso28178.preamble. Tags used in the preamble are listed in 4.2.

The data section is the second section, which is further divided into two parts. The first part of the data section provides the information that describes the type and location of the table contents; the second section contains the data values.

The schema associated with the XML format defined in this International Standard is contained in file iso28178_data.xsd, which is an essential normative part of this International Standard. This International Standard also provides structural XML tags that are needed for the proper specification of an XML document instance.

NOTE See Annex A for a discussion on the need and application of the XML data reporting format.

4.1.2 ASCII format

This file format is an ASCII format keyword-value file. It makes use of predefined keywords and data tables. Values are associated with the keyword that precedes them and remain in effect until another instance of the keyword-value pair. Data values are delimited by the BEGIN_DATA and END_DATA keywords.

Keywords and values, as well as fields within data tables, are separated by white space. Valid white space characters are space (position 2/0 of ISO/IEC 646), carriage return (position 0/13 of ISO/IEC 646), newline (position 0/10 of ISO/IEC 646), and tab (position 0/9 of ISO/IEC 646). Keywords may be separated from values using any valid white space character. Only the space and tab may precede a keyword on a line. Comments are preceded by a single comment character (a single character keyword). The comment character is the “#” (position 2/3 of ISO/IEC 646) symbol. Comments may begin any place on a line, and are terminated by a newline or carriage return character.

4.1.3 Exchanged data file structure

A file containing measurement data would normally be structured as shown in Figure 1. This structure allows multiple tables of data within a single exchange file.

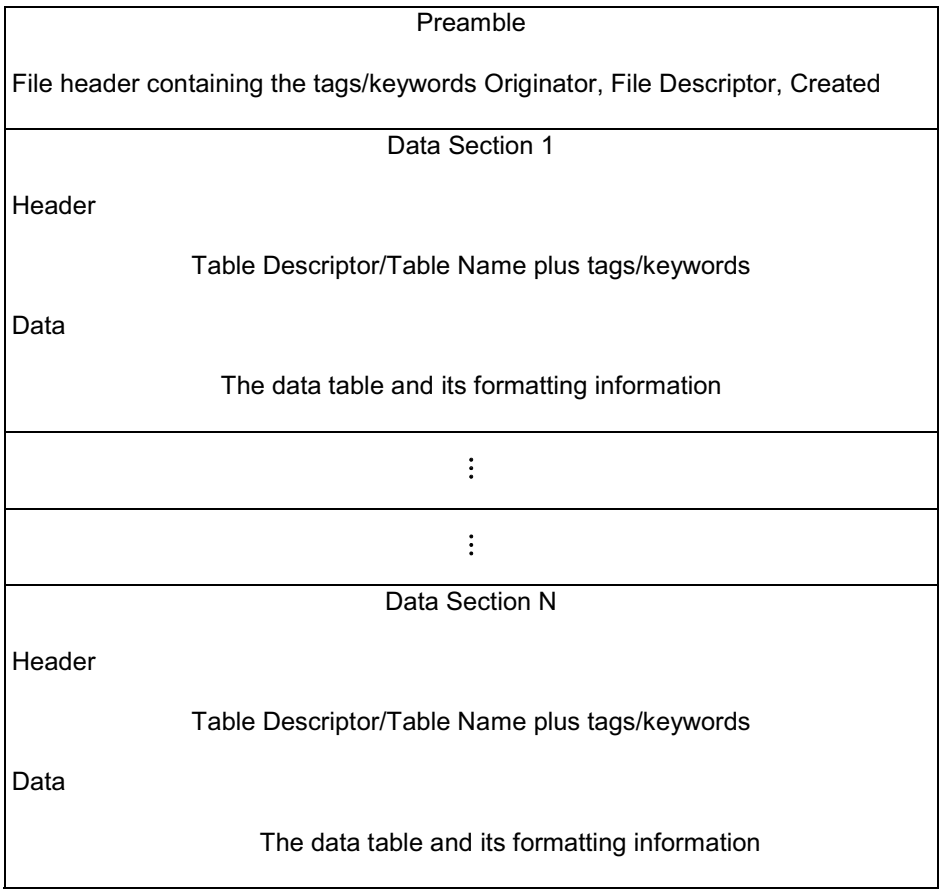

Figure 1 — File structure

4.2 Tags and keywords

4.2.1 General

Most tags and keywords may appear in the file in any order, and may appear multiple times within the file. Values associated with tags and keywords that appear more than once shall be replaced by successive instances, except for KEYWORD, COMPUTATIONAL_PARAMETER, and WEIGHTING_FUNCTION. Each identifier shall show whether it may be used only once or multiple times within a given table. Tags and keywords that describe data tables, however, shall be defined before the data table. Table 1 lists these tags and keywords. These tags are described in greater detail below.

Table 1 — XML tags and ASCII keywords that appear in a defined order

Function	XML tag	ASCII keyword
data table width	<number_of_fields>	NUMBER_OF_FIELDS
data format delimiters	<data_format>	BEGIN_DATA_FORMAT END_DATA_FORMAT
data table length	<number_of_sets>	NUMBER_OF_SETS
data table delimiters	<table>	BEGIN_DATA END_DATA