

ISO/TC 213

Secretariat: BSI

Voting begins on:
2020-05-29

Voting terminates on:
2020-07-24

Geometrical product specifications (GPS) — Surface texture: Areal —

Part 72: XML file format x3p AMENDMENT 1

*Spécification géométrique des produits (GPS) — État de surface:
Surfacique —*

*Partie 72: Format de fichier XML x3p
AMENDEMENT 1*

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

ISO/CEN PARALLEL PROCESSING



Reference number
ISO 25178-72:2017/FDAM 1:2020(E)

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/6c85f2c5-4d3a-4e0a-977d-e8a4e22024c/iso-25178-72-2017-fdamd-1>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 213, *Dimensional and geometrical product specifications and verification*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 290, *Dimensional and geometrical product specification and verification*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Full standard:
<https://standards.iteh.ai/catalog/standards/sist/6c85f2c5-4d3a-4eca-977d-e8a4ef22024c/iso-25178-72-2017-fdamd->

Geometrical product specifications (GPS) — Surface texture: Areal —

Part 72: XML file format x3p

AMENDMENT 1

Page 3, 3.14

Replace with:

3.14

global coordinate system

three-dimensional, right-handed coordinate system in which the position and orientation of the original point cloud is defined

Page 3, 3.15

Replace with:

3.15

view coordinate system

three-dimensional, right-handed coordinate system in which the stored point coordinates are defined

Note 1 to entry: Conversion from view coordinates (x, y, z) to global coordinates (X, Y, Z) could involve rotation and translation.

Note 2 to entry: Many instruments measure the z coordinates of surface points in the view coordinate system at predefined values of the respective x and y coordinates.

Page 5, 5.4.4

Replace EXAMPLE with:

EXAMPLE A vendor specific extension could be a vendor specific xml file or any other type of file.

Page 5, 5.5.3.1

Replace with:

5.5.3.1 Revision

The `Revision` record shall contain the string "ISO25178-72:2017/DAM1".

Page 7, 5.5.3.3.2.1

Replace with:

5.5.3.3.2.1 General

The `AxisType` element shall be one of the letters "I" for incremental axis or "A" for absolute axis. The x and y coordinates can either be of incremental axis type or absolute axis type. The z coordinates shall be of absolute axis type.

Page 7, 5.5.3.3.2.3

Replace with:

5.5.3.3.2.3 Absolute axis type

An absolute axis type shall be used for the explicit storage of x , y and z coordinates. Coordinates of absolute axis type shall be stored as dimensionless values. The dimensional coordinate shall be calculated by multiplying the stored value by a scaling factor I in metres.

NOTE 1 Compared with an incremental axis type, the absolute axis type causes a higher memory usage for x and y coordinates. The amount of memory used is as large as for the z coordinate because for each 3D point the x and y coordinate is stored separately. Therefore, it is recommended that incremental x and y axes are used whenever possible, i.e. when point spacing is regular and homogenous.

NOTE 2 The constant I is usually called calibration factor.

Page 8, 5.5.3.3.4

Replace with:

5.5.3.3.4 Increment

The `Increment` element shall contain a positive length value in metres specifying either the increment of the incremental axis or the scaling factor of the absolute axis. The increment shall not be zero. The increment values for the x , y and z axes are named with the symbols I_x , I_y and I_z .

NOTE The element name `Increment` is used due to historic reasons.

Page 8, 5.5.3.5

Replace with:

5.5.3.5 Coordinate transformation

The calculation of the global coordinates from the view coordinates of the stored 3D points is made using Formula (2):

$$\begin{pmatrix} X \\ Y \\ Z \end{pmatrix} = \begin{pmatrix} r_{11} & r_{12} & r_{13} \\ r_{21} & r_{22} & r_{23} \\ r_{31} & r_{32} & r_{33} \end{pmatrix} \cdot \begin{pmatrix} I_x & 0 & 0 \\ 0 & I_y & 0 \\ 0 & 0 & I_z \end{pmatrix} \cdot \begin{pmatrix} x \\ y \\ z \end{pmatrix} + \begin{pmatrix} O_x \\ O_y \\ O_z \end{pmatrix} \tag{2}$$

where

- X, Y, Z are the global coordinates in metres;
- x, y, z are the dimensionless view coordinates;
- $r_{11} \dots r_{33}$ are the rotation elements;
- I_x, I_y, I_z are the increment values in metres or scaling factors in metres;
- O_x, O_y, O_z are the offset values in metres.

Page 10, 5.5.5.2.2

Replace with:

5.5.5.2.2 MatrixDimension

The `MatrixDimension` element shall contain the three elements `SizeX`, `SizeY` and `SizeZ`, defining the size of the data matrix in u , v and w dimensions.

The names of the elements `SizeX`, `SizeY` and `SizeZ` could be misleading because they do not necessarily define anything directly related to x , y and z dimensions of the 3D coordinates. In datasets with incremental x and y axes the following relation between u and x , as well as between v and y , holds:

$$x = u - 1, y = v - 1$$

where

$$u = 1, \dots, \text{SizeX}, v = 1, \dots, \text{SizeY}$$

EXAMPLE 1 Definition of a matrix with 4×4 points and one surface layer:

<SizeX>4</SizeX> <SizeY>4</SizeY> <SizeZ>1</SizeZ>

EXAMPLE 2 Definition of a matrix for a profile data set with 10 points and two profile layers:

<SizeX>10</SizeX> <SizeY>1</SizeY> <SizeZ>2</SizeZ>

Page 13, 5.5.5.3.5

Replace with:

5.5.5.3.5 Binary validity file format

The binary validity file shall be written as a packed array of bits. The bit index j into the packed array shall be calculated in the same way as described for the data list in 5.5.5.3.2.1. From the bit index, the byte position j_8 and the bit position j_1 in the packed array shall be calculated using Formulae (3) and (4):

$$\lfloor j_8 = \frac{j}{8} \rfloor \tag{3}$$

$$j_1 = j - 8 \cdot j_8 \tag{4}$$

The notation $\lfloor _ \rfloor$ calculates the next smaller integer for a real number.

EXAMPLE See Table 1 for a sample calculation of the indices.

Table 1 — Example calculation of byte and bit index for binary validity file

j	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
j_8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2
j_1	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0

Page 14, 5.5.7

Replace with:

5.5.7 Vendor specific extensions

The `VendorSpecificID` element shall be used to identify extensions of the x3p file format. This tag shall contain a vendor specific ID, which is a URI created by the vendor identifying a vendor specific extension file. The URI shall consist of a worldwide unique domain name, an optional file path and the vendor specific extension file name itself. When writing an x3p file, the vendor specific extension file shall be placed in the zip-container under the given URI, replacing "." with "\" in the domain name. When reading an x3p file an unknown `VendorSpecificID` element can be safely ignored as well as all optional contents of the zip container. The number of `VendorSpecificID` elements is unbounded.

NOTE 1 Name collisions are avoided if a unique URL is used to construct a path to the vendor specific extension file.

NOTE 2 An x3p file containing vendor specific extensions keeps full compatibility to all software able to read standard x3p files.

EXAMPLE For the `VendorSpecificID` (URI) "<http://www.vendor.com/mypath/myelements.xml>", the vendor specific extension file is placed in the x3p zip-container under "[www\vendor\com\mypath\myelements.xml](http://www.vendor.com/mypath/myelements.xml)".

Page 15, A.2

Replace with:

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="http://www.opengps.eu/2008/ISO5436_2" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://www.opengps.eu/2008/ISO5436_2" elementFormDefault="unqualified">
```



```

<xsd:annotation>
  <xsd:documentation>
    XML-implementation for ISO5436-2 file format.

    First revision 04-Apr-2007
    Second revision 20-Jan-2020

    Copyright by Georg Wiora (NanoFocus AG), Jörg Seewig (Universität Hannover),
    Andreas Walther (NanoFocus AG), Mark A. Weber (NanoFocus AG) 2007
    Jörg Seewig (Technische Universität Kaiserslautern) 2020

    openGPS and the openGPS logo is a registered trademark of
    Physikalisch Technische Bundesanstalt (PTB)
    http://www.ptb.de/

    More information about openGPS can be found at
    http://www.opengps.eu/
  </xsd:documentation>
</xsd:annotation>
<xsd:element name="ISO5436_2" type="ISO5436_2Type">
</xsd:element>
<xsd:complexType name="Record1Type">
  <xsd:sequence>
    <xsd:element name="Revision" type="xsd:token" minOccurs="1" maxOccurs="1">
</xsd:element>
    <xsd:element name="FeatureType" maxOccurs="1" minOccurs="1">
      <xsd:simpleType>
        <xsd:restriction base="xsd:token">
          <xsd:whiteSpace value="collapse">
</xsd:whiteSpace>
          <xsd:enumeration value="PRF">
</xsd:enumeration>
          <xsd:enumeration value="SUR">
</xsd:enumeration>
          <xsd:enumeration value="PCI">
</xsd:enumeration>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:element>
    <xsd:element name="Axes" type="AxesType" maxOccurs="1" minOccurs="1">
</xsd:element>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ISO5436_2Type">
  <xsd:sequence>
    <xsd:element name="Record1" type="Record1Type" maxOccurs="1" minOccurs="1">
</xsd:element>
    <xsd:element name="Record2" type="Record2Type" maxOccurs="1" minOccurs="0">
</xsd:element>
    <xsd:element name="Record3" type="Record3Type" maxOccurs="1" minOccurs="1">
</xsd:element>
    <xsd:element name="Record4" type="Record4Type" maxOccurs="1" minOccurs="1">
</xsd:element>
    <xsd:element name="VendorSpecificID" type="xsd:anyURI" minOccurs="0"
maxOccurs="unbounded">
</xsd:element>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="Record2Type">
  <xsd:sequence>
    <xsd:element name="Date" type="xsd:dateTime" maxOccurs="1" minOccurs="1">
</xsd:element>
    <xsd:element name="Creator" type="xsd:token" maxOccurs="1" minOccurs="0">
</xsd:element>
    <xsd:element name="Instrument" type="InstrumentType" maxOccurs="1" minOccurs="1">
</xsd:element>
    <xsd:element name="CalibrationDate" type="xsd:dateTime" maxOccurs="1"
minOccurs="0">
</xsd:element>
    <xsd:element name="ProbingSystem" type="ProbingSystemType" maxOccurs="1"
minOccurs="1">

```