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**Information technology — Font
information interchange —**

Part 2:

**Interchange format
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*Technologies de l'information — Échange d'informations sur les
fontes*
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Reference number
ISO/IEC 9541-2:1991(E)

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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. 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.

International Standard ISO/IEC 9541-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

ISO/IEC 9541 consists of the following parts, under the general title *Information technology — Font information interchange*:

- Part 1: *Architecture*
- Part 2: *Interchange Format*
- Part 3: *Glyph shape representation*
- Part 4: *Application-specific requirements*

Part 1 of ISO/IEC 9541 specifies the architecture of a font resource, i.e., the font description, font metrics, glyph description and glyph metrics properties required for font references and the interchange of font resources.

Part 2 of ISO/IEC 9541 specifies the interchange formats for font information, and the minimum subsets of that information required for interchange.

Part 3 of ISO/IEC 9541 specifies the architecture and interchange formats for glyph shape representations.

Part 4 of ISO/IEC 9541 specifies the architecture and interchange format extensions for application specific (e.g. typesetting of mathematics) requirements.

Annexes A and B form an integral part of this part of ISO/IEC 9541.

Introduction

The use of open networks for the interchange of documents in both office and publishing environments has shown the need for a mechanism enabling the interchange of font information.

It is foreseen that publishing and office technologies will merge and that this development will be facilitated by definition of a standard font resource architecture and a limited number of standard font resource interchange formats.

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Information technology — Font information interchange —

Part 2: Interchange format

1 Scope

ISO/IEC 9541, as a whole, specifies the architecture of font resources, as well as the formats for font interchange amongst information processing systems. It also specifies the architecture and formats that can be used to construct font references in general electronic document interchange.

This part of ISO/IEC 9541 specifies the interchange formats for font information, and the minimum subsets of that information required for interchange. This part of ISO/IEC 9541 requires the property definitions as defined in ISO/IEC 9541-1.

Font subsets defined by this part of ISO/IEC 9541 establish the minimum set of font properties that must occur within an ISO font resource. To accommodate the broad range of document and text processing functions found in office and publishing environments, it is anticipated that ISO font resources will contain more than the minimum number of font properties.

Font resources defined by this part of ISO/IEC 9541 are used in various document processing environments in which ASN.1 or SGML parsing algorithms are recognised. The format of font resource information as defined in this part of ISO/IEC 9541 is specified in both ASN.1 and SGML for consistent generation of font resources for use in these processing environments.

2 Conformance

A font resource conforming to this part of ISO/IEC 9541 shall contain property values for all of the minimum subset font properties specified in this part of ISO/IEC 9541, clause 5. A conforming font resource may contain more ISO or non-ISO properties than specified in this part of ISO/IEC 9541, clause 5. In addition, all properties contained in a conforming font resource shall be formatted as defined in one of the two interchange formats defined in this part of ISO/IEC 9541, clause 6.

A font resource using system (one which receives font information for subsequent processing) may claim conformance to this part of ISO/IEC 9541 if it has the ability to syntactically interpret and semantically process the relevant font subset(s) specified in this part of ISO/IEC 9541, clause 5.

A font resource supplying system (one which creates or modifies font information for subsequent supply to a font resource using system) may claim conformance to this part of ISO/IEC 9541 if it has the ability to create a syntactically correct instance of a conforming font resource.

A font resource transmission system (one which receives, optionally holds, and subsequently transmits font information) may claim conformance to this part of ISO/IEC 9541 if it has the ability to receive and send a syntactically correct instance of a conforming font resource without loss of information.

3 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 9541. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 9541 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8824:1990, *Information technology — Open Systems Interconnection — Specification of Abstract Syntax Notation One (ASN.1)*.

ISO 8825:1990, *Information technology — Open Systems Interconnection — Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1)*.

ISO 8879:1986, *Information processing — Text and office systems — Standard Generalized Markup Language (SGML)*.

ISO/IEC 9070:1991, *Information technology — SGML support facilities — Registration procedures for public text owner identifiers*.

ISO/IEC 9541-1:1991, *Information technology — Font information interchange — Part 1: Architecture*.

4 Definitions

For the purposes of this part of ISO/IEC 9541, the definitions given in ISO/IEC 9541-1 and the following definition apply.

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4.1 (font) subset: A set or collection of font properties, usually associated by application usage and functional capability.

5 Subsets

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This clause defines the minimum set of font properties which shall occur within a font resource conforming to this part of ISO/IEC 9541. The required set of font resource properties is divided into font subsets representing three major groupings of required font resource information (font description information, modal metric information, and glyph metric information). ISO font subsets consist entirely of ISO font properties, as those properties are defined in ISO/IEC 9541-1.

NOTE 1 Glyph shape information may be resident within a presentation device and not interchanged with the other font resource information. The shape information may be interchanged with a font resource, but is not a required subset of an ISO font resource.

5.1 Minimum font description subset

The minimum subset of font description information includes identification of the font resource and descriptive information about the font resource.

This font subset consists of the following properties (higher order property-lists containing these properties are also required):

FONTNAME	Font Resource Name
STANDARDVERSION	Standard Version Number
DSNSOURCE	Design Source Name
FONTFAMILY	Font Family Name
POSTURE	Posture Code
WEIGHT	Weight Code
PROPWIDTH	Proportionate Width Code
INCGLYPHCOLS	Included Glyph Collection(s) One or
INCGLYPHS	Included Glyph(s) Both

DSNSIZE	Design Size
MINSIZE	Minimum Size
MAXSIZE	Maximum Size
DSNGROUP	Design Group Codes
STRUCTURE	Structure Code

5.2 Minimum modal metric subset

The minimum subset of modal metric information includes identification of at least one writing mode and modal metric values for the collection of all glyphs in the font resource.

This subset consists of the following properties, which are repeated for each writing mode supported by the font resource (higher order property-lists containing these properties are also required):

WRMODENAME	Writing Mode Name	
NOMESCDIR	Nominal Escapement Direction	
ESCCLASS	Escapement Class	
AVGESCX	Average x-Escapement	
AVGESCY	Average y-Escapement	x or y
AVGLCESCX	Average Lower Case x-Escapement	must be
AVGLCESCY	Average Lower Case y-Escapement	present,
AVGCAPESCX	Average Capital x-Escapement	depending
AVGCAPESCY	Average Capital y-Escapement	on writing
TABESCX	Tabular x-Escapement	mode
TABESCY	Tabular y-Escapement	
MAXFONTEXT	Maximum Font Extents	

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5.3 Minimum glyph metric subset

The minimum subset of glyph metric information includes identification of each glyph contained in the font resource and metric information for each of those identified glyphs.

This subset consists of the following properties, which are repeated for each writing mode supported by the font resource and for each glyph supported in that writing mode (higher order property-lists containing these properties are also required):

GNAME	Glyph Structured Name	
EX	X Escapement Point	One or
EY	Y Escapement Point	both
EXT	Extents	

6 Formats

ISO font resources for interchange shall be defined using either the ASN.1 Structure or SGML Document Type Definition defined below.

NOTE 2 The architecture of ISO/IEC 9541-1 and the interchange formats of this part of ISO/IEC 9541 permit the existence of empty property-lists, however, there are no assumed values associated with such lists.

6.1 ASN.1

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ISO-STANDARD-9541-FONT-RESOURCE {1 0 9541 2 1}
DEFINITIONS ::= BEGIN

IMPORTS Structured-Name FROM {1 0 9541 2 3}

Font-Resource ::= SEQUENCE {
  name-prefixes          [0] IMPLICIT SET OF Name-Prefix OPTIONAL,
  iso-standard-9541-fontname [1] IMPLICIT Global-Name
  ,
  iso-standard-9541-fontdescription [2] IMPLICIT Font-Description
  ,
  iso-standard-9541-wrmodes [3] IMPLICIT Writing-Modes
  ,
  iso-standard-9541-shapes [4] IMPLICIT Glyph-Shapes OPTIONAL,
  non-iso-properties [5] IMPLICIT Property-List OPTIONAL }

Font-Description ::= SET {
  iso-standard-9541-dataversion [0] IMPLICIT Data-Version OPTIONAL,
  iso-standard-9541-standardversion [1] IMPLICIT Cardinal
  ,
  iso-standard-9541-datasource [2] IMPLICIT Global-Name OPTIONAL,
  iso-standard-9541-datacopyright [3] IMPLICIT Message OPTIONAL,
  iso-standard-9541-dsnsource [4] IMPLICIT Global-Name
  ,
  iso-standard-9541-dsncopyright [5] IMPLICIT Message OPTIONAL,
  iso-standard-9541-relunits [6] IMPLICIT Cardinal OPTIONAL,
  iso-standard-9541-typeface [7] IMPLICIT Message OPTIONAL,
  iso-standard-9541-fontfamily [8] IMPLICIT Match-String
  ,
  iso-standard-9541-posture [9] IMPLICIT Posture-Code
  ,
  iso-standard-9541-postureangle [10] IMPLICIT Angle OPTIONAL,
  iso-standard-9541-weight [11] IMPLICIT Weight-Code
  ,
  iso-standard-9541-propwidth [12] IMPLICIT Width-Code
  ,
  iso-standard-9541-glyphcomp [13] IMPLICIT Glyph-Complement
  ,
  iso-standard-9541-nomwrmode [14] IMPLICIT Global-Name OPTIONAL,
  iso-standard-9541-dsnsizes [15] IMPLICIT Rational
  ,
  iso-standard-9541-minsize [16] IMPLICIT Rational
  ,
  iso-standard-9541-maxsize [17] IMPLICIT Rational
  ,
  iso-standard-9541-capheight [18] IMPLICIT Rel-Rational OPTIONAL,
  iso-standard-9541-lcheight [19] IMPLICIT Rel-Rational OPTIONAL,
  iso-standard-9541-dsngroup [20] IMPLICIT Design-Group
  ,
  iso-standard-9541-structure [21] IMPLICIT Structure-Code
  ,
  iso-standard-9541-minfeatsz [22] IMPLICIT Rel-Rational OPTIONAL,
  iso-standard-9541-nomcapstemwidth [23] IMPLICIT Rel-Rational OPTIONAL,
  iso-standard-9541-nomlcstemwidth [24] IMPLICIT Rel-Rational OPTIONAL,
  non-iso-properties [25] IMPLICIT Property-List OPTIONAL }

Name-Prefix ::= SEQUENCE {
  -- see global name note at the end of this clause
  index [0] IMPLICIT Code,
  prefix [1] IMPLICIT Structured-Name }

Data-Version ::= SEQUENCE {
  major [0] IMPLICIT Cardinal OPTIONAL,
  minor [1] IMPLICIT Cardinal OPTIONAL,
  timestamp [2] IMPLICIT UTCTime OPTIONAL }

Posture-Code ::= INTEGER { not applicable (0),
  upright (1),
  oblique-forward (2),
  oblique-backward (3),
  italic-forward (4),
  italic-backward (5),
  other (6) }

Weight-Code ::= INTEGER { not applicable (0),

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        ultra-light      (1),
        extra-light     (2),
        light           (3),
        semi-light      (4),
        medium          (5),
        semi-bold       (6),
        bold            (7),
        extra-bold      (8),
        ultra-bold      (9) }

Width-Code ::= INTEGER {
    not applicable      (0),
    ultra-condensed    (1),
    extra-condensed    (2),
    condensed           (3),
    semi-condensed     (4),
    medium             (5),
    semi-expanded      (6),
    expanded           (7),
    extra-expanded     (8),
    ultra-expanded     (9) }

Glyph-Complement ::= SEQUENCE {
    -- at least one included glyph list or at least one
    -- included glyph collection list is mandatory
    iso-standard-9541-numglyphs [0] IMPLICIT Cardinal OPTIONAL,
    iso-standard-9541-incglyphcols [1] IMPLICIT SET OF Global-Name OPTIONAL,
    -- at least one is required
    iso-standard-9541-excglyphcols [2] IMPLICIT SET OF Global-Name OPTIONAL,
    -- at least one is required
    iso-standard-9541-incglyphs [3] IMPLICIT SET OF Global-Name OPTIONAL,
    -- at least one is required
    iso-standard-9541-excglyphs [4] IMPLICIT SET OF Global-Name OPTIONAL,
    -- at least one is required
    non-iso-properties [5] IMPLICIT Property-List OPTIONAL }

Design-Group ::= SEQUENCE {
    -- see 9541-1 Annex-A for code values
    group-code [0] IMPLICIT Code,
    subgroup-code [1] IMPLICIT Code,
    specific-group-code [2] IMPLICIT Code }

Structure-Code ::= INTEGER {
    not applicable      (0),
    solid               (1),
    outline             (2) }

Writing-Modes ::= SET {
    iso-standard-9541-wrmode [0] IMPLICIT SET OF Writing-Mode ,
    non-iso-properties [1] IMPLICIT Property-List OPTIONAL }

Writing-Mode ::= SEQUENCE {
    iso-standard-9541-wrmodename [0] IMPLICIT Global-Name,
    wrmode-properties [1] IMPLICIT Modal-Properties }

Modal-Properties ::= SET {
    iso-standard-9541-nomeskdir [0] IMPLICIT Angle ,
    iso-standard-9541-escclass [1] IMPLICIT Esc-Class-Code ,
    iso-standard-9541-avgescx [2] IMPLICIT Rel-Rational ,
    iso-standard-9541-avgescy [3] IMPLICIT Rel-Rational ,
    iso-standard-9541-avglcescx [4] IMPLICIT Rel-Rational ,
    iso-standard-9541-avglcescy [5] IMPLICIT Rel-Rational ,
    iso-standard-9541-avgcapescx [6] IMPLICIT Rel-Rational ,
    iso-standard-9541-avgcapescy [7] IMPLICIT Rel-Rational ,

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iso-standard-9541-tabescx	[8] IMPLICIT Rel-Rational	,
iso-standard-9541-tabescy	[9] IMPLICIT Rel-Rational	,
iso-standard-9541-maxfontext	[10] IMPLICIT Max-Extents	,
iso-standard-9541-sectors	[11] IMPLICIT Sectors	OPTIONAL,
iso-standard-9541-escadjs	[12] IMPLICIT SET OF Adjusts	OPTIONAL,
iso-standard-9541-minescadjsze	[13] IMPLICIT Rational	OPTIONAL,
iso-standard-9541-maxescadjsze	[14] IMPLICIT Rational	OPTIONAL,
iso-standard-9541-scores	[15] IMPLICIT Scores	OPTIONAL,
iso-standard-9541-vsceipts	[16] IMPLICIT Variant-Scripts	OPTIONAL,
iso-standard-9541-minlinesp	[17] IMPLICIT Alignment-Spacing	OPTIONAL,
iso-standard-9541-minanascale	[18] IMPLICIT Rational	OPTIONAL,
iso-standard-9541-maxanascale	[19] IMPLICIT Rational	OPTIONAL,
iso-standard-9541-nomalign	[20] IMPLICIT Font-Global-Name	OPTIONAL,
iso-standard-9541-alignmodes	[21] IMPLICIT Alignment-Modes	OPTIONAL,
iso-standard-9541-copyfits	[22] IMPLICIT Copyfits	OPTIONAL,
iso-standard-9541-dsnwordadd	[23] IMPLICIT Rel-Rational	OPTIONAL,
iso-standard-9541-dsnwordampl	[24] IMPLICIT Rational	OPTIONAL,
iso-standard-9541-minwordadd	[25] IMPLICIT Rel-Rational	OPTIONAL,
iso-standard-9541-minwordampl	[26] IMPLICIT Rational	OPTIONAL,
iso-standard-9541-maxwordadd	[27] IMPLICIT Rel-Rational	OPTIONAL,
iso-standard-9541-maxwordampl	[28] IMPLICIT Rational	OPTIONAL,
iso-standard-9541-dsnletteradd	[29] IMPLICIT Rel-Rational	OPTIONAL,
iso-standard-9541-dsnletterampl	[30] IMPLICIT Rational	OPTIONAL,
iso-standard-9541-minletteradd	[31] IMPLICIT Rel-Rational	OPTIONAL,
iso-standard-9541-minletterampl	[32] IMPLICIT Rational	OPTIONAL,
iso-standard-9541-maxletteradd	[33] IMPLICIT Rel-Rational	OPTIONAL,
iso-standard-9541-maxletterampl	[34] IMPLICIT Rational	OPTIONAL,
iso-standard-9541-glyphmetrics	[35] IMPLICIT Glyph-Metrics	,
non-iso-properties	[36] IMPLICIT Property-List	OPTIONAL }

Esc-Class-Code ::= INTEGER { not applicable (0),
monospace (1),
proportional (2) }
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Max-Extents	::= SEQUENCE {	
max-minx	[0] IMPLICIT Rel-Rational,	
max-miny	[1] IMPLICIT Rel-Rational,	
max-maxx	[2] IMPLICIT Rel-Rational,	
max-maxy	[3] IMPLICIT Rel-Rational }	
Sectors	::= SET {	
iso-standard-9541-sector	[0] IMPLICIT SEQUENCE OF Sector	OPTIONAL,
non-iso-properties	[1] IMPLICIT Property-List	OPTIONAL }
Sector	::= SEQUENCE {	
sector-left	[0] IMPLICIT Rel-Rational,	
sector-right	[1] IMPLICIT Rel-Rational }	
Adjusts	::= SET {	
iso-standard-9541-adjust	[0] IMPLICIT SET OF Adjust,	
non-iso-properties	[1] IMPLICIT Property-list	OPTIONAL }
Adjust	::= SET {	
iso-standard-9541-escadjname	[0] IMPLICIT Global-Name,	
adjust-properties	[1] IMPLICIT Adjust-Properties }	
Adjust-Properties	::= SET {	
iso-standard-9541-cpea	[0] IMPLICIT CPEA-Properties	OPTIONAL,
iso-standard-9541-sec	[1] IMPLICIT SEC-Properties	OPTIONAL,
non-iso-properties	[2] IMPLICIT Property-List	OPTIONAL }
CPEA-Properties	::= SET {	

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iso-standard-9541-ncpeaforwd      [0] IMPLICIT Cardinal      OPTIONAL,
iso-standard-9541-ncpeabackwd     [1] IMPLICIT Cardinal      OPTIONAL,
iso-standard-9541-cpeax           [2] SEQUENCE OF Rel-Rational OPTIONAL,
                                   -- at least one required
iso-standard-9541-cpeay           [3] SEQUENCE OF Rel-Rational OPTIONAL,
non-iso-properties                [4] IMPLICIT Property-List  OPTIONAL }

SEC-Properties ::= SET {
  iso-standard-9541-secx          [0] SEQUENCE OF {
                                   -- at least one required
                                   [0] IMPLICIT Rational,
                                   [1] IMPLICIT Rel-Rational } OPTIONAL,
  iso-standard-9541-secy          [1] SEQUENCE OF {
                                   -- at least one required
                                   [0] IMPLICIT Rational,
                                   [1] IMPLICIT Rel-Rational } OPTIONAL,
  non-iso-properties              [2] IMPLICIT Property-List  OPTIONAL }

Scores ::= SET {
  iso-standard-9541-score         [0] IMPLICIT SET OF Score    OPTIONAL,
  non-iso-properties              [1] IMPLICIT Property-List  OPTIONAL }

Score ::= SEQUENCE {
  iso-standard-9541-scorename     [0] IMPLICIT Global-Name,
  score-property-list             [1] IMPLICIT Score-Properties }

Score-Properties ::= SET {
  iso-standard-9541-scoreoffsetx  [0] IMPLICIT Rel-Rational    OPTIONAL,
  iso-standard-9541-scoreoffsety  [1] IMPLICIT Rel-Rational    OPTIONAL,
  iso-standard-9541-scorethick    [2] IMPLICIT Rel-Rational    OPTIONAL,
  non-iso-properties              [3] IMPLICIT Property-List  OPTIONAL }

Variant-Scripts ::= SET {
  iso-standard-9541-vscript        [0] IMPLICIT SET OF Vscript  OPTIONAL,
  non-iso-properties              [1] IMPLICIT Property-List  OPTIONAL }

Vscript ::= SEQUENCE {
  iso-standard-9541-vsname        [0] IMPLICIT Global-Name,
  vscript-property-list           [1] IMPLICIT Vscript-Properties }

Vscript-Properties ::= SET {
  iso-standard-9541-vsoffsetx     [0] IMPLICIT Rel-Rational    OPTIONAL,
  iso-standard-9541-vsoffsety     [1] IMPLICIT Rel-Rational    OPTIONAL,
  iso-standard-9541-vsscalex      [2] IMPLICIT Rational        OPTIONAL,
  iso-standard-9541-vsscaley      [3] IMPLICIT Rational        OPTIONAL,
  non-iso-properties              [4] IMPLICIT Property-List  OPTIONAL }

Alignment-Spacing ::= SEQUENCE {
  minlinesp-left                 [0] IMPLICIT Rel-Rational,
  minlinesp-right                [1] IMPLICIT Rel-Rational }

Alignment-Modes ::= SET {
  iso-standard-9541-align         [0] IMPLICIT SET OF Alignment  OPTIONAL,
  non-iso-properties              [1] IMPLICIT Property-List  OPTIONAL }

Alignment ::= SEQUENCE {
  iso-standard-9541-alignname     [0] IMPLICIT Global-Name,
  alignment-property-list         [1] IMPLICIT Align-Properties }

Align-Properties ::= SET {
  iso-standard-9541-alignoffsetx  [0] IMPLICIT Rel-Rational    OPTIONAL,
  iso-standard-9541-alignoffsety  [1] IMPLICIT Rel-Rational    OPTIONAL,

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iso-standard-9541-alignscalex      [2] IMPLICIT Rational          OPTIONAL,
iso-standard-9541-alignscaley      [3] IMPLICIT Rational          OPTIONAL,
non-iso-properties                  [4] IMPLICIT Property-List     OPTIONAL }

Copyfits ::= SET {
  iso-standard-9541-copyfit         [0] IMPLICIT SET OF Copyfit    OPTIONAL,
  non-iso-properties                 [1] IMPLICIT Property-List     OPTIONAL }

Copyfit ::= SEQUENCE {
  iso-standard-9541-copyfitname     [0] IMPLICIT Global-Name,
  copyfit-properties                 [1] IMPLICIT Copyfit-Properties }

Copyfit-Properties ::= SET {
  iso-standard-9541-copyfitmeasure  [0] IMPLICIT Rational          OPTIONAL,
  non-iso-properties                 [1] IMPLICIT Property-List     OPTIONAL }

Glyph-Metrics ::= SET {
  iso-standard-9541-gmetric         [0] IMPLICIT SET OF Glyph-Property-List ,
  non-iso-properties                 [1] IMPLICIT Property-List     OPTIONAL }

Glyph-Property-List ::= SEQUENCE {
  iso-standard-9541-gname           [0] IMPLICIT Global-Name,
  glyph-properties                  [1] IMPLICIT Glyph-Properties }

Glyph-Properties ::= SET {
  iso-standard-9541-px               [0] IMPLICIT Rel-Rational      OPTIONAL,
  iso-standard-9541-py               [1] IMPLICIT Rel-Rational      OPTIONAL,
  iso-standard-9541-ex                [2] IMPLICIT Rel-Rational      ,
  iso-standard-9541-ey                [3] IMPLICIT Rel-Rational      ,
  iso-standard-9541-ext               [4] IMPLICIT Extents           ,
  iso-standard-9541-lgs               [5] IMPLICIT Ligatures         OPTIONAL,
  iso-standard-9541-peas              [6] IMPLICIT P-Adjusts         OPTIONAL,
  iso-standard-9541-cpeal             [7] IMPLICIT C-Indicator       OPTIONAL,
  iso-standard-9541-eai               [8] IMPLICIT E-Code           OPTIONAL,
  iso-standard-9541-minex              [9] IMPLICIT Rel-Rational      OPTIONAL,
  iso-standard-9541-miney             [10] IMPLICIT Rel-Rational     OPTIONAL,
  iso-standard-9541-maxex             [11] IMPLICIT Rel-Rational     OPTIONAL,
  iso-standard-9541-maxey             [12] IMPLICIT Rel-Rational     OPTIONAL,
  non-iso-properties                 [13] IMPLICIT Property-List     OPTIONAL }

Extents ::= SEQUENCE {
  minx                               [0] IMPLICIT Rel-Rational,
  miny                               [1] IMPLICIT Rel-Rational,
  maxx                              [2] IMPLICIT Rel-Rational,
  maxy                               [3] IMPLICIT Rel-Rational }

Ligatures ::= SET {
  iso-standard-9541-lg               [0] IMPLICIT SET OF Ligature    OPTIONAL,
  non-iso-properties                 [1] IMPLICIT Property-List     OPTIONAL }

Ligature ::= SEQUENCE {
  iso-standard-9541-lgn              [0] IMPLICIT Global-Name,
  iso-standard-9541-lgsn             [1] SEQUENCE OF Global-Name }
  -- at least one required

P-Adjusts ::= SET {
  iso-standard-9541-pea              [0] IMPLICIT SET OF P-Adjust    OPTIONAL,
  non-iso-properties                 [1] IMPLICIT Property-List     OPTIONAL }

P-Adjust ::= SEQUENCE {
  iso-standard-9541-pean             [0] IMPLICIT Global-Name,
  p-adjust-property-list             [1] IMPLICIT P-Adjust-Properties }

```

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