
British Standard

Computer graphics: programmer's hierarchical interactive graphics system (PHIGS)

Part 3. Specification for clear-text encoding of archive file

Infographie: Interface entre un programme d'application et son support graphique
Partie 3. Codage en clair des textes des fichiers d'archives

Hierarchisches Interaktives Graphisches System für Programmierer
Teil 3. Codierung der Archiv-Datei mit Text

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Specification

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National foreword

This Part of BS 7217 has been prepared under the direction of the Information Systems Technology Standards Policy Committee. It is identical with ISO/IEC 9592-3 'Information processing systems – Computer graphics – Programmer's Hierarchical Interactive Graphics System (PHIGS) – Part 3 : 1989 Clear-text encoding of archive file' published by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

The UK actively participated through BSI Technical Committee IST/31 in the development of ISO/IEC 9592-3.

Cross-references

International standard	Corresponding British Standard
ISO 646 : 1983	BS 4730 : 1985 Specification for UK 7-bit coded character set (Identical, exercising national options)
ISO 2022 : 1986	BS 6856 : 1987 Specification for code extension techniques for United Kingdom 7-bit and 8-bit coded character sets (Identical)
ISO 6093 : 1985	BS 6727 : 1987 Specification for representation of numerical values in character strings for information interchange (Identical)
	BS 6945 Specification for computer graphics: metafile for the storage and transfer of picture description information (CGM)
ISO 8632-1 : 1987	Part 1 : 1988 Functional specification (Identical)
ISO 8632-2 : 1987	Part 2 : 1988 Character encoding (Identical)
ISO 8632-3 : 1987	Part 3 : 1988 Binary encoding (Identical)
ISO 8632-4 : 1987	Part 4 : 1988 Clear text encoding (Identical)

NOTE. The cross-references are undated in the text.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Amendment No. 1
published and effective from 30 September 1991
to BS 7217 : Part 3 : 1989
Computer graphics : programmer's hierarchical
interactive graphics system (PHIGS)
Part 3. Specification for clear-text encoding of
archive file

NOTE. The European Committee for Standardization (CEN) has accepted ISO/IEC 9592-3 : 1989 as a European Standard designated as EN 29592-3 : 1991. This amendment implements EN 29592-3 : 1991 as a British Standard.

Revised text

AMD 6388
September 1991

Front and back covers

In the top right-hand corner of the front cover and twice on the back cover, immediately above 'ISO/IEC 9592-3 : 1989' insert 'EN 29592-3 : 1991'.

At the foot of the front cover, insert the following.

'This European Standard EN 29592-3 : 1991 has the status of a British Standard'

AMD 6388
September 1991

National foreword

At the end of paragraph 1, insert the following new paragraph.

'In 1991 the European Committee for Standardization (CEN) accepted ISO/IEC 9592-3 : 1989 as European Standard EN 29592-3 : 1991.'

AMD 6388
September 1991

New EN title page, foreword and endorsement notice

Immediately after the national foreword, insert the attached new EN title page, foreword and endorsement notice.

UDC: 681.3.01 : 681.3.072.2 : 084

Descriptors: Data processing, teleprocessing, information interchange, graphic data processing, computer interfaces, computer programs, files, archives, codification

English version

Information processing systems — Computer graphics — Programmer's Hierarchical Interactive Graphics System (PHIGS) — Part 3 : Clear-text encoding of archive file

(ISO/IEC 9592-3 : 1989 – edition 1)

Systèmes de traitement de l'information
– Infographie – Interface de programmation
du système graphique hiérarchisé (PHIGS) –
Partie 3 : Codage mode texte en clair du fichier
d'archive
(ISO/IEC 9592-3 : 1989 – édition 1)

Graphische Systeme der Informationsverarbeitung
– Hierarchisches Interaktives Graphisches Systems
für Programmierer –
Teil 3 : Codierung der Archiv-Datei mit Text
(ISO/IEC 9592-3 : 1989 – Ausgabe 1)

This European Standard was approved by CEN on 6 March 1991, and is identical to the ISO standard as referred to.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in two official versions (English and French). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

The Technical Board has decided to submit the International Standard

Information processing systems — Computer graphics — Programmer's Hierarchical Interactive Graphics System (PHIGS) — Part 3 : Clear text encoding of archive file to formal Vote, and the result was positive.

For the time being, this document exists only in the English and French versions.

According to the CEN/CENELEC Common Rules, the following countries are bound to implement this standard.

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

Endorsement notice

The text of the International Standard ISO/IEC 9592-3, edition 1, 1989, was approved by CEN as a European Standard without any modification.

Amendment No. 2
published and effective from 15 June 1994
to BS 7217 : Part 3 : 1989 (EN 29592-3)

Computer graphics : Programmer's hierarchical interactive
graphics system (PHIGS)
Part 3. Specification for clear-text encoding of archive file

NOTE. This amendment implements amendment A1 to
EN 29592-3 : 1991 which is identical with Amendment 1 : 1992 to
ISO/IEC 9592-3 : 1989. This amendment together with European
Standard EN 29592-3 : 1991 has the status of a British Standard.

Revised text

National foreword (as amended by Amendment No. 1)
In line 3, after 'file', insert ', including Amendment 1,'.

AMD 8138/June 1994

EN amendment title page and foreword
Insert the attached EN amendment title page (foreword on reverse).

AMD 8138/June 1994

Text of EN 29592-3
Amend the text of the European Standard EN 29592-3 in accordance with the details
given on the attached pages.

AMD 8138/June 1994

UDC 681.3.01 : 681.3.072.2 : 084

Descriptors: Data processing, teleprocessing, information interchange, graphic data processing, computer interfaces, computer programs, files, archives, codification

English version

Information processing systems — Computer graphics — Programmer's Hierarchical Interactive Graphics System (PHIGS) — Part 3: Clear-text encoding of archive file

(ISO/IEC 9592-3 : 1989, Amendment 1 : 1992)

Systèmes de traitement de l'information —
Infographie — Interface de programmation du
système graphique hiérarchisé (PHIGS) —
Partie 3: Codage mode texte en clair du fichier
d'archive
(ISO/IEC 9592-3 : 1989, Amendement 1 : 1992)

Graphische Systeme der Informationsverarbeitung
— Hierarchisches Interaktives Graphisches
Systems für Programmierer — Teil 3: Codierung
der Archiv-Datei mit Text
(ISO/IEC 9592-3 : 1989, Änderung 1 : 1992)

This European Standard was approved by CEN on 1993-09-06. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

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Ref. No. EN 29592-3 : 1991/A1 : 1993 E

Foreword

On the proposal of the CEN Central Secretariat, the Technical Board has decided to submit this draft amendment:

'Information processing systems — Computer graphics — Programmer's Hierarchical Interactive Graphics System (PHIGS) — Part 3: Clear-text encoding of archive file (ISO/IEC 9592-3 : 1989, Amendment 1 : 1992)' to the Unique Acceptance Procedure (UAP).

The result of the Unique Acceptance Procedure was positive.

For the time being, this document exists only in English.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 1994, and conflicting national standards shall be withdrawn at the latest by March 1994.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

4.2.4.5 Derived types

Add the following:

COLRCURVE	::= <LEFT PAREN><OPTSEP> <I:ORDER> <SEP> <RLIST:KNOTS> <SEP> <RATIONAL NONRATIONAL> <SEP> <I:COLOUR TYPE> <SEP> <COLRVLIST:CONTROL_POINTS> <OPTSEP> <RIGHT PAREN>
COLRSURF	::= <LEFT PAREN><OPTSEP> <I:U_ORDER> <SEP> <I:V_ORDER> <SEP> <RLIST:U_KNOTS> <SEP> <RLIST:V_KNOTS> <SEP> <RATIONAL NONRATIONAL> <SEP> <I:COLOUR_TYPE> <SEP> <COLRVLISTS:CONTROL_POINTS> <OPTSEP> <RIGHT PAREN>
NOTE: Each COLRVLIST contains control points along the u dimension.	
COLRV	::= < <I:COLOUR_INDEX> <COORDLIST:COLOUR_COORDINATES> >
COLRVLIST	::= <LEFT PAREN> <OPTSEP> < <COLRV> <<SEP> <COLRV>>* >0 <OPTSEP> <RIGHT PAREN>
COLRVLISTS	::= <LEFT PAREN> <OPTSEP> < <COLRVLIST> <<SEP> <COLRVLIST>>* >0 <OPTSEP> <RIGHT PAREN>

COLRVROWS	::= COLRVLISTS
COORDLIST	::= <LEFT PAREN> <OPTSEP> <COORD> << SEP> <COORD>>*<OPTSEP> <RIGHT PAREN>
CURVEAPPROXDATAREC	::= <LEFT PAREN> <OPTSEP> <<I:COUNT> <R:APPROXIMATION_VALUE> <S:TYPE_DEPENDENT_DATA>>0 <OPTSEP> <RIGHT PAREN>
DATAMAPPINGDATAREC	::= <LEFT PAREN> <OPTSEP> < <DATAMAPPINGDATAREC1> <DATAMAPPINGDATAREC2> <DATAMAPPINGDATAREC3> <DATAMAPPINGDATAREC4> <DATAMAPPINGDATAREC5> <S:METHOD_DEPENDENT_DATA> >0 <OPTSEP><RIGHT PAREN>
DATAMAPPINGDATAREC1	::= <SOURCESELECTORLIST:SELECTOR>
DATAMAPPINGDATAREC2	::= <SOURCESELECTORLIST:SELECTOR> <SEP> <I:INDEX> <SEP> <R:LOWER_LIMIT> <SEP> <R:UPPER_LIMIT> <SEP> <I:COLOUR_TYPE> <SEP> <CORLVLIST:COLOUR_LIST>
DATAMAPPINGDATAREC3	::= <SOURCESELECTORLIST:SELECTOR> <SEP> <I:INDEX> <SEP> <RLIST:RANGE_BOUNDARIES> <SEP> <I:COLOUR_TYPE> <SEP> <CORLVLIST:COLOUR_LIST>
DATAMAPPINGDATAREC4	::= <SOURCESELECTORLIST:SELECTOR> <SEP> <I:INDEX_1> <SEP> <I:INDEX_2> <SEP> <R:Ra_LOWER_LIMIT> <SEP> <R:Ra_UPPER_LIMIT> <SEP> <R:Rb_LOWER_LIMIT> <SEP> <R:Rb_UPPER_LIMIT> <SEP> <I:COLOUR_TYPE> <SEP> <CORLVLISTS:COLOUR_LISTS>

DATAMAPPINGDATAREC5	::= <SOURCESELECTORLIST:SELECTOR> <SEP> <I:INDEX_1> <SEP> <I:INDEX_2> <SEP> <RLISTS:Ra_RANGE_BOUNDARIES> <SEP> <RLISTS:Rb_RANGE_BOUNDARIES> <SEP> <I:COLOUR_TYPE> <SEP> <CORLVLISTS:COLOUR_LISTS>
DATASURF	::= <LEFT PAREN> <OPTSEP> <I:U_ORDER> <SEP> <I:V_ORDER> <SEP> <RLIST:U_KNOTS> <SEP> <RLIST:V_KNOTS> <SEP> <RATIONAL NONRATIONAL> <SEP> <RLISTS:LIST:CONTROL_POINTS> <OPTSEP> <RIGHT PAREN>
NOTE: Each RLIST is a single control point. Each RLISTS contains control points along the <i>u</i> dimension.	
DATASURFLIST	::= <LEFT PAREN> <OPTSEP> <DATASURF> <<SEP> <DATASURF>>* <OPTSEP> <RIGHT PAREN>
EDGEDATAFLAG	::= < NONE EDGE_VISIBILITY_FLAGS >
EDGEFLAG	::= < OFF ON >
EDGEFLAG2	::= <LEFT PAREN> <OPTSEP> <EDGEFLAG> <SEP> <EDGEFLAG> <OPTSEP> <RIGHT PAREN>
EDGEFLAG2ROW	::= <LEFT PAREN> <OPTSEP> < <EDGEFLAG2> <<SEP> <EDGEFLAG2>>* >0 <OPTSEP> <RIGHT PAREN>
EDGEFLAG3	::= <LEFT PAREN> <OPTSEP> <EDGEFLAG> <SEP> <EDGEFLAG> <SEP> <EDGEFLAG> <OPTSEP> <RIGHT PAREN>
EDGEFLAG3LIST	::= <LEFT PAREN> <OPTSEP> < <EDGEFLAG3> <<SEP> <EDGEFLAG3>>* >0 <OPTSEP> <RIGHT PAREN>
EDGEFLAGLIST	::= <LEFT PAREN> <OPTSEP> < <EDGEFLAG> <<SEP> <EDGEFLAG>>* >0 <OPTSEP> <RIGHT PAREN>
EDGEFLAGLISTS	::= <LEFT PAREN> <OPTSEP> < <EDGEFLAGLIST> <<SEP> <EDGEFLAGLIST>>* >0 <OPTSEP> <RIGHT PAREN>

EDGEFLAGLISTSLIST	::= <LEFT PAREN> <OPTSEP> < <EDGEFLAGLISTS> <<SEP> <EDGEFLAGLISTS>>* >o <OPTSEP> <RIGHT PAREN>
EDGEFLAGROW	::= <EDGEFLAGLIST>
FACETDATA	::= <LEFT PAREN> <OPTSEP> <COLRV>o <<SEP> <V3:UNIT_NORMAL>>o <<SEP> <RLIST:DATA_MAPPING_DATA>>o <OPTSEP> <RIGHT PAREN>
FACETDATAFLAG	::= < NONE FACET_COLR FACET_NORMAL FACET_DATA FACET_COLR_NORMAL FACET_COLR_DATA FACET_NORMAL_DATA FACET_COLR_NORMAL_DATA >
FACETDATALIST	::= <LEFT PAREN> <OPTSEP> < <FACETDATA> <<SEP> <FACETDATA>>* >o <OPTSEP> <RIGHT PAREN>
FACETDATALISTS	::= <LEFT PAREN> <OPTSEP> < <FACETDATALIST> <<SEP> <FACETDATALIST>>* >o <OPTSEP> <RIGHT PAREN>
FACETDATAROW	::= <FACETDATALIST>
GCOLR	::= <I:COLOUR_TYPE> <SEP> <COLRV>
INT3	::= <LEFT PAREN> <OPTSEP> <I> <SEP> <I> <SEP> <I> <OPTSEP> <RIGHT PAREN>
INT3LIST	::= <LEFT PAREN> <OPTSEP> < <INT3> <<SEP> <INT3>>* >o <OPTSEP> <RIGHT PAREN>>
INT3LISTS	::= <LEFT PAREN> <OPTSEP> < <INT3LIST> <<SEP> <INT3LIST>>* >o <OPTSEP> <RIGHT PAREN>>
INTLIST	::= <LEFT PAREN> <OPTSEP> < <I> <<SEP> <I>>* >o <OPTSEP> <RIGHT PAREN>>

INTLISTS	::= <LEFT PAREN> <OPTSEP> < <INTLIST> <<SEP> <INTLIST>>* >o <OPTSEP> <RIGHT PAREN>>
INTLISTSLIST	::= <LEFT PAREN> <OPTSEP> < <INTLISTS> <<SEP> <INTLISTS>>* >o <OPTSEP> <RIGHT PAREN>>
P4	::= < <POINT4> <LEFT PAREN> <OPTSEP> <POINT4> <OPTSEP> <RIGHT PAREN> >
POINT4	::= <COORD:wX> <SEP> <COORD:wY> <SEP> <COORD:wZ> <SEP> <COORD:w>
POINTLIST4	::= < <P4:POINT> <<SEP> <P4:POINT>>* >o
PARAMSURFCHARACDATAREC	::= <LEFT PAREN> <OPTSEP> < <PARAMSURFCHARACDATAREC3> <PARAMSURFCHARACDATAREC4> <S:TYPE_DEPENDENT_DATA> >o <OPTSEP> <RIGHT PAREN>
PARAMSURFCHARACDATAREC3	::= <UNIFORM NONUNIFORM> <SEP> <I:U_COUNT> <SEP> <I:V_COUNT> <OPTSEP> <RIGHT PAREN>
PARAMSURFCHARACDATAREC4	::= <P3:ORIGIN_POINT> <SEP> <V3:DIRECTION_VECTOR> <SEP> <RLIST:PARAMETERS>
REFLPROPSDATAREC	::= <LEFT PAREN> <OPTSEP> < <REFLDATAREC1> <S:METHOD_DEPENDENT_DATA> >o <OPTSEP> <RIGHT PAREN>
REFLPROPSDATAREC1	::= <R:AMBIENT_REFLECTION_COEFFICIENT> <SEP> <R:DIFFUSE_REFLECTION_COEFFICIENT> <SEP> <R:SPECULAR_REFLECTION_COEFFICIENT> <SEP> <GCOLR:SPECULAR_COLOUR> <SEP> <R:SPECULAR_EXPONENT>

RLIST	::= <LEFT PAREN> <OPTSEP> < <R> <<SEP> <R>>* >0 <OPTSEP> <RIGHT PAREN>
RLISTS	::= <LEFT PAREN> <OPTSEP> < <RLIST> <<SEP> <RLIST>>* >0 <OPTSEP> <RIGHT PAREN>
RLISTSLIST	::= <LEFT PAREN> <OPTSEP> < <RLISTS> <<SEP> <RLISTS>>* >0 <OPTSEP> <RIGHT PAREN>
SOURCESELECTOR	::= < COLOUR_ASPECT VERTEX_COLOUR VERTEX_DATA FACET_COLOUR FACET_DATA >
SOURCESELECTORLIST	::= <LEFT PAREN> <OPTSEP> < <SOURCESELECTOR> <<SEP> <SOURCESELECTOR>>* >0 <OPTSEP> <RIGHT PAREN>
SURFAPPROXDATAREC	::= <LEFT PAREN> <OPTSEP> < <I:U_COUNT> <SEP> <I:V_COUNT> <R:APPROXIMATION_VALUE> <R:U_APPROXIMATION_VALUE> <SEP> <R:V_APPROXIMATION_VALUE> <S:TYPE_DEPENDENT_DATA>>0 <OPTSEP> <RIGHT PAREN>>
TRIMCURVE	::= <LEFT PAREN> <OPTSEP> < <I:APPROXIMATION_TYPE> <SEP> <CURVEAPPROXDATAREC:DATA_RECORD> <OFF ON:EDGE_FLAG> <SEP> <I:ORDER> <SEP> <RLIST:KNOTS> <SEP> <R:TMIN> <SEP> <R:TMAX> <SEP> < <RATIONAL <SEP> <POINTLIST3:CONTROL_POINTS>> <NONRATIONAL <SEP> <POINTLIST2:CONTROL_POINTS>> > <OPTSEP> <RIGHT PAREN>
TRIMLOOP	::= <LEFT PAREN> <OPTSEP> < <TRIMCURVE> <<SEP> <TRIMCURVE>>* <OPTSEP> <RIGHT PAREN>

TRIMLOOPLIST	::= <LEFT PAREN> <OPTSEP> <TRIMLOOP> <<SEP> <TRIMLOOP>>* <OPTSEP> <RIGHT PAREN>
VERTEXDATA2	::= <LEFT PAREN> <OPTSEP> <P2:POINT> <<SEP> <COLRV>>o <<SEP> <V3:UNIT_NORMAL>>o <<SEP> <RLIST:DATA_MAPPING_DATA>>o <OPTSEP> <RIGHT PAREN>
VERTEXDATA2LIST	::= <LEFT PAREN> <OPTSEP> < <VERTEXDATA2> <<SEP> <VERTEXDATA2>>* >o <OPTSEP> <RIGHT PAREN>
VERTEXDATA2LISTS	::= <LEFT PAREN> <OPTSEP> < <VERTEXDATA2LIST> <<SEP> <VERTEXDATA2LIST>>* >o <OPTSEP> <RIGHT PAREN>
VERTEXDATA3	::= <LEFT PAREN> <OPTSEP> <P3:POINT> <<SEP> <COLRV>>o <<SEP> <V3:UNIT_NORMAL>>o <<SEP> <RLIST:DATA_MAPPING_DATA>>o <OPTSEP> <RIGHT PAREN>
VERTEXDATA3LIST	::= <LEFT PAREN> <OPTSEP> < <VERTEXDATA3> <<SEP> <VERTEXDATA3>>* >o <OPTSEP> <RIGHT PAREN>
VERTEXDATA3LISTS	::= <LEFT PAREN> <OPTSEP> < <VERTEXDATA3LIST> <<SEP> <VERTEXDATA3LIST>>* >o <OPTSEP> <RIGHT PAREN>
VERTEXDATAFLAG	::= < COORD COORD_COLR COORD_NORMAL COORD_DATA COORD_COLR_NORMAL COORD_COLR_DATA COORD_NORMAL_DATA COORD_COLR_NORMAL_DATA >
VERTEXDATAPL3	::= <LEFT PAREN> <OPTSEP> <P3:POINT> <<SEP> <COLRV>>o <OPTSEP> <RIGHT PAREN>

VERTEXDATAPL3LIST	::= <LEFT PAREN> <OPTSEP> < <VERTEXDATAPL3> <<SEP> <VERTEXDATAPL3>>* >o <OPTSEP> <RIGHT PAREN>
VERTEXDATAPL3LISTS	::= <LEFT PAREN> <OPTSEP> < <VERTEXDATAPL3LIST> <<SEP> <VERTEXDATAPL3LIST>>* >o <OPTSEP> <RIGHT PAREN>

4.2.5.1 Terms deleted

Add the following:

OF, WITH

4.2.5.3 Words used unabbreviated

Add the following:

BACK, CURVE, DATA, FRONT, LIGHT, MAPPING, MODE

4.2.5.4 Abbreviations

Add the following:

APPROXIMATION	→	APPROX
CHARACTERISTICS	→	CHARAC
CRITERIA	→	CRIT
CULLING	→	CULL
DEPTH CUE	→	DEPTHCUE
DISTINGUISHING	→	DIST
METHOD	→	METH
NON_UNIFORM_B_SPLINE	→	NUNIBSP
PARAMETRIC	→	PARAM
PROPERTIES	→	PROPS
QUADRILATERAL	→	QUAD
REFLECTANCE	→	REFL
RENDERING	→	REND
SHADING	→	SHAD
SOURCE	→	SRC
SURFACE	→	SURF
TRIANGLE	→	TRI
TRIMMING CURVE	→	TRIMCURV

4.2.5.7 The derived archive file element names

Add the following:

POLYLINE SET 3 WITH COLOUR	→	ARF_LINESET3COLR
FILL AREA SET 3 WITH DATA	→	ARF_FILLAREASET3DATA
FILL AREA SET WITH DATA	→	ARF_FILLAREASETDATA
CELL ARRAY 3 PLUS	→	ARF_CELLARRAY3PLUS
SET OF FILL AREA SETS 3 WITH DATA	→	ARF_SETFILLAREASETS3DATA
SET OF FILL AREA SETS WITH DATA	→	ARF_SETFILLAREASETSDATA
TRIANGLE SET 3 WITH DATA	→	ARF_TRISSET3DATA
TRIANGLE SET WITH DATA	→	ARF_TRISSETDATA
TRIANGLE STRIP 3 WITH DATA	→	ARF_TRISTRIP3DATA
TRIANGLE STRIP WITH DATA	→	ARF_TRISTRIPDATA
QUADRILATERAL MESH 3 WITH DATA	→	ARF_QUADMESH3DATA
QUADRILATERAL MESH WITH DATA	→	ARF_QUADMESHDATA
NON-UNIFORM B-SPLINE CURVE	→	ARF_NUNIBSPCURVE
NON-UNIFORM B-SPLINE CURVE WITH COLOUR	→	ARF_NUNIBSPCURVECOLR
NON-UNIFORM B-SPLINE SURFACE	→	ARF_NUNIBSPSURF
NON-UNIFORM B-SPLINE SURFACE WITH DATA	→	ARF_NUNIBSPSURFDATA
SET DATA MAPPING INDEX	→	ARF_DATAMAPPINGINDEX
SET REFLECTANCE INDEX	→	ARF_REFLINDEX
SET BACK INTERIOR INDEX	→	ARF_BACKINTINDEX
SET BACK DATA MAPPING INDEX	→	ARF_BACKDATAMAPPINGINDEX
SET BACK REFLECTANCE INDEX	→	ARF_BACKREFLINDEX
SET PARAMETRIC SURFACE INDEX	→	ARF_PARAMSURFINDEX
SET POLYLINE COLOUR	→	ARF_LINECOLR
SET POLYLINE SHADING METHOD	→	ARF_LINESHADMETH
SET POLYMARKER COLOUR	→	ARF_MARKERCOLR
SET TEXT COLOUR	→	ARF_TEXTCOLR
SET FACET DISTINGUISHING MODE	→	ARF_FACETDISTMODE
SET FACET CULLING MODE	→	ARF_FACETCULLMODE
SET INTERIOR COLOUR	→	ARF_INTCOLR
SET INTERIOR SHADING METHOD	→	ARF_INTSHADMETH
SET DATA MAPPING METHOD	→	ARF_DATAMAPPINGMETH
SET REFLECTANCE PROPERTIES	→	ARF_REFLPROPS
SET REFLECTANCE MODEL	→	ARF_REFLMODEL

SET BACK INTERIOR STYLE	→	ARF_BACKINTSTYLE
SET BACK INTERIOR STYLE INDEX	→	ARF_BACKINTSTYLEINDEX
SET BACK INTERIOR COLOUR	→	ARF_BACKINTCOLR
SET BACK INTERIOR SHADING METHOD	→	ARF_BACKINTSHADMETH
SET BACK DATA MAPPING METHOD	→	ARF_BACKDATAMAPPINGMETH
SET BACK REFLECTANCE PROPERTIES	→	ARF_BACKREFLPROPS
SET BACK REFLECTANCE MODEL	→	ARF_BACKREFLMODEL
SET LIGHT SOURCE STATE	→	ARF_LIGHTSRCSTATE
SET EDGE COLOUR	→	ARF_EDGECOLR
SET CURVE APPROXIMATION CRITERIA	→	ARF_CURVEAPPROXCRIT
SET SURFACE APPROXIMATION CRITERIA	→	ARF_SURFAPPROXCRIT
SET PARAMETRIC SURFACE CHARACTERISTICS	→	ARF_PARAMSURFCHARAC
SET RENDERING COLOUR MODEL	→	ARF_RENDCOLRMODEL
SET DEPTH CUE INDEX	→	ARF_DEPTHCUEINDEX
SET COLOUR MAPPING INDEX	→	ARF_COLRMAPPINGINDEX

4.3.3 The structure element production

Add the following:

```

|
<POLYLINE SET 3 WITH COLOUR> |
<FILL AREA SET 3 WITH DATA> |
<FILL AREA SET WITH DATA> |
<CELL ARRAY 3 PLUS> |
<SET OF FILL AREA SETS 3 WITH DATA> |
<SET OF FILL AREA SETS WITH DATA> |
<TRIANGLE SET 3 WITH DATA> |
<TRIANGLE SET WITH DATA> |
<TRIANGLE STRIP 3 WITH DATA> |
<TRIANGLE STRIP WITH DATA> |
<QUADRILATERAL MESH 3 WITH DATA> |
<QUADRILATERAL MESH WITH DATA> |
<NON-UNIFORM B-SPLINE CURVE> |
<NON-UNIFORM B-SPLINE CURVE WITH COLOUR> |
<NON-UNIFORM B-SPLINE SURFACE> |
<NON-UNIFORM B-SPLINE SURFACE WITH DATA> |

```